No. 720,017. PATENTED FEB. 10, 1903.

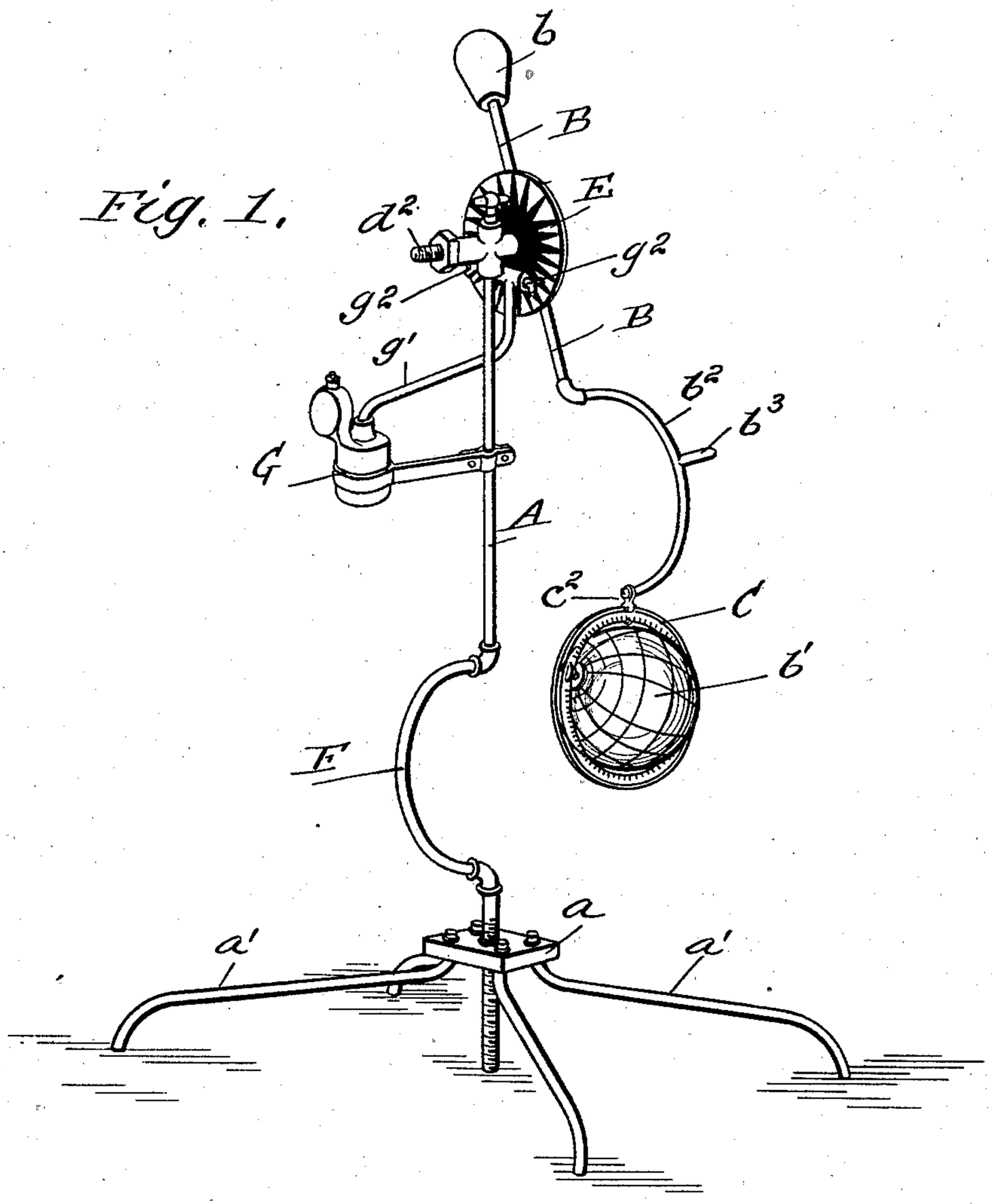
E. P. GRAM.

TELLURIAN.

APPLICATION FILED SEPT. 8, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

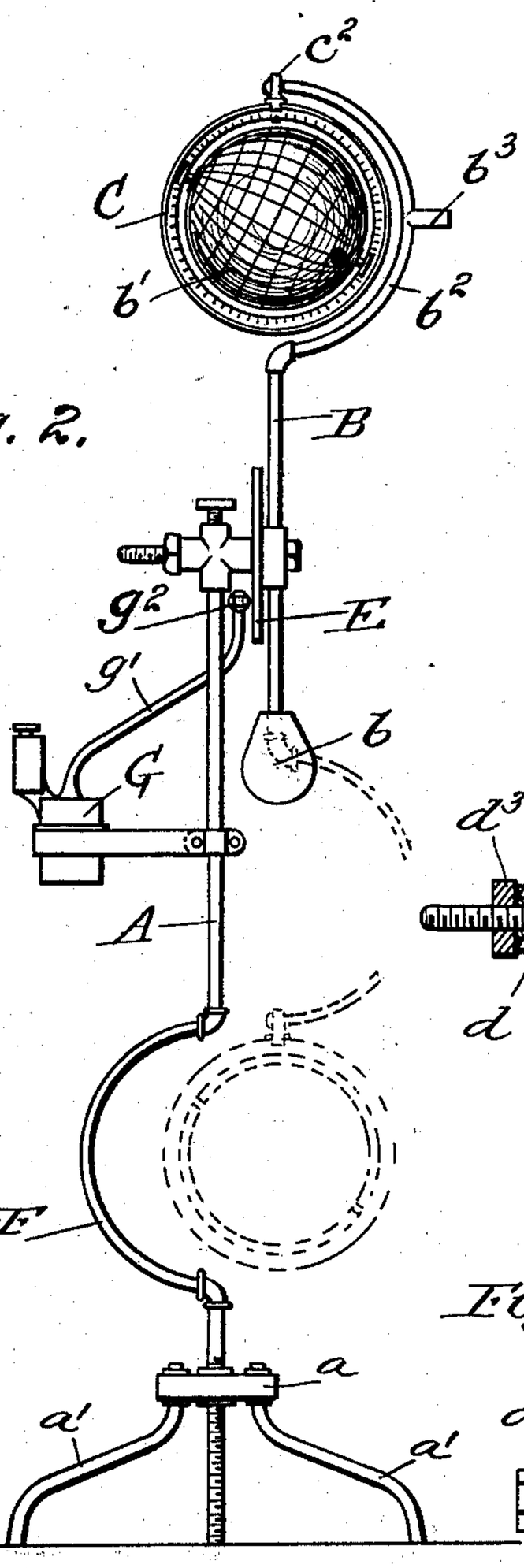


Fig. 3.

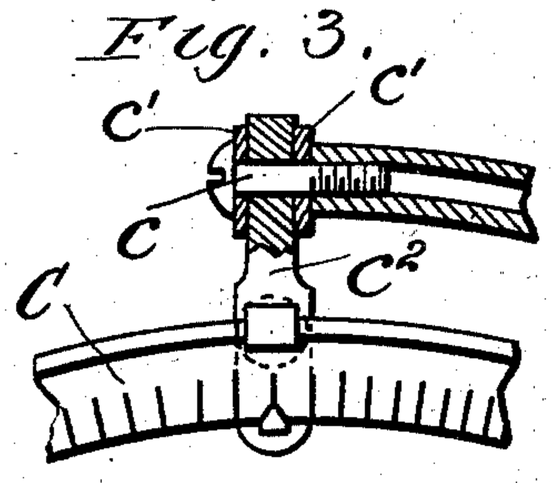


Fig. 4.

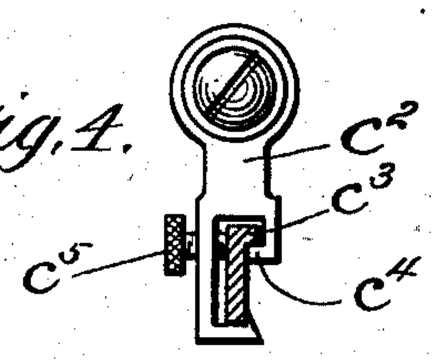


Fig. 5.

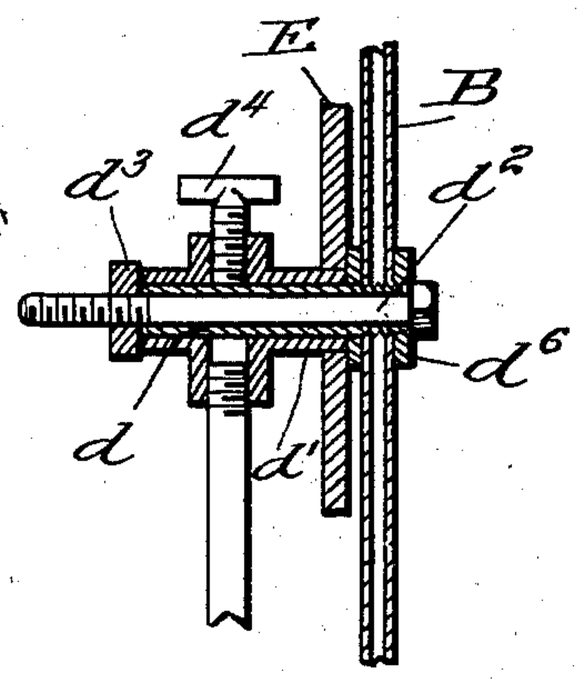


Fig. 7.

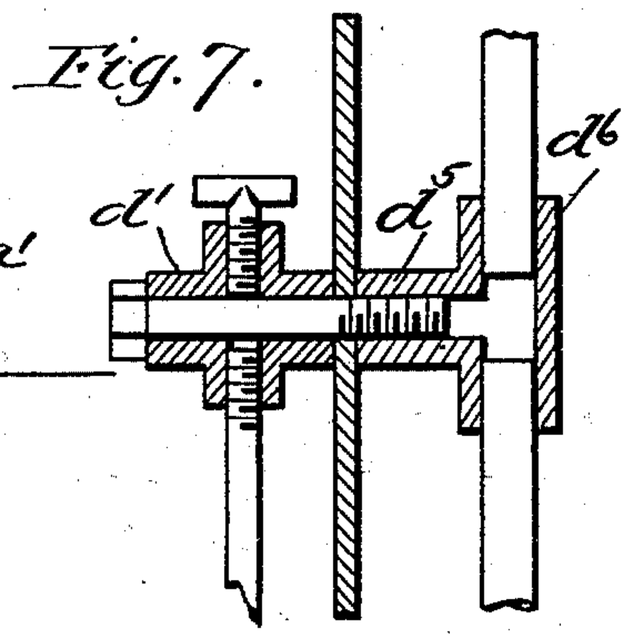
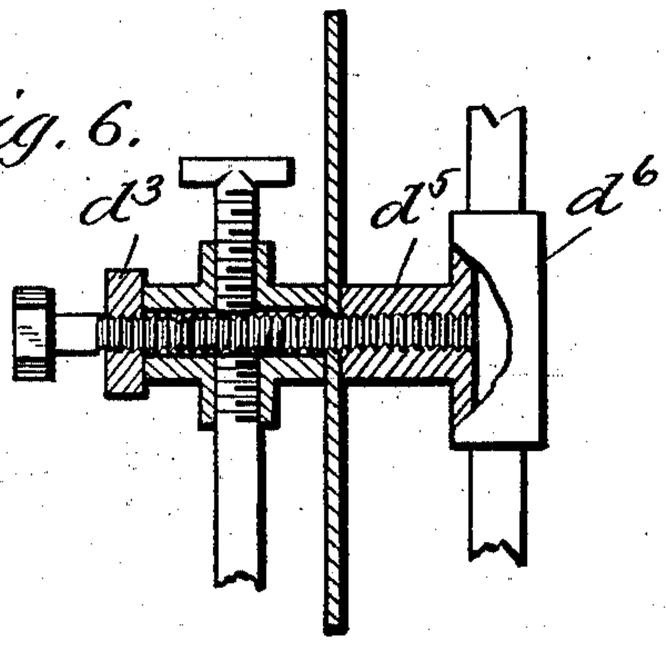


Fig. 6.



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TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 720,017, dated February 10, 1903.

Application filed September 8, 1902. Serial No. 122,597. (No model.)

To all whom it may concern:

Be it known that I, EVAN P. GRAM, a citizen of the United States of America, residing at Lincoln, in the county of Logan and State of Illinois, have invented certain new and useful Improvements in Tellurians, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a perspective view, and Fig. 2 a side elevation, of my improved tellurian; Figs. 3 and 4, detail sectional views showing the hanger for suspending the globe-ring; Figs. 5, 6, and 7, sectional views of various ways of supporting the globe-carrying arm, which are more fully hereinafter set forth.

The object of this invention is to provide a simple, inexpensive, and compact apparatus that may be employed for giving a physical illustration of the relation of the earth to the sun, the width of the zones, the location of the tropical and polar circles, the equinoxes, the change of seasons, the variation in the length of the days and nights, the inclination of the earth's axis, &c.

The invention consists of certain novel features of construction and combinations of parts hereinafter described and claimed.

Referring to the drawings by letters, A designates the standard of the frame, which is preferably constructed of light tubing and the lower end of which is threaded centrally through a base-plate *a*, which is provided with a series of pivotal legs or supports *a'*, spreading outward from its respective corners. The standard is so adjusted in the base-plate that its lower end will rest upon the support at the center of the apparatus, and thereby contribute to stability. Attached to a horizontal journal supported in the upper end of the frame is a vertically-rotating arm B, said arm being attached to the journal at a suitable point between its ends and carrying at one end a counterbalance *b* and at its other end a globe *b'*. This arm is preferably made of light tubing, and the part to which the globe is attached is provided with a semicircular lateral bend b^2, and screwed into the extreme end of the bent or curved part is a screw *c*, on which is loosely hung, between washers *c'*, a hanger c^2, which is adjustably connected to the pendent globe-supporting ring C, within which latter the globe is rotatably supported on pivots representing its axis. With this construction the globe-frame and globe will hang freely upon the horizontal screw *c*, but will have no lateral movement. The lower end of the hanger is notched or bifurcated, so as to embrace the globe-ring, said ring being provided with a lateral circumferential flange c^3, which is engaged by an inward-projecting lug c^4 on the hanger. With this arrangement the ring may be adjusted on the hanger to vary the axis of the globe, and in order to lock the parts in their adjusted position a set-screw c^5 is threaded through the hanger and adapted to bear upon the side of the ring opposite the flange c^3 and lug c^4.

To rotate the arm *b* upon its journal, the arm is preferably provided at about the center of its bent portion b^2 with a handle b^3.

Any suitable devices may be employed for journaling the globe-carrying arm upon the upper end of the standard. In Fig. 5 the arm is provided with a lateral sleeve *d*, which fits and rotates within a horizontal tube *d'*, attached to the upper end of the standard, and to fasten said tube removably within its casing a long bolt d^2 is passed through the arm and through the tube and is provided on its inner threaded end with a clamp-nut d^3. A set-screw d^4 is threaded through a nipple on the upper side of tube *d'* and adapted to bear upon the rotating tube *d* and cause sufficient friction to prevent the globe-carrying arm revolving too freely, so that said globe-carrying arm will normally remain at rest at any point of its rotation that the operator may desire to bring it to a standstill. In the form shown in Fig. 6 the bolt d^2 is passed through stationary tube *d'* from the inner end and is screwed tightly into a tube or nipple d^5, projecting laterally from the arm B, and the set-screw d^4 bears directly upon the threads of said bolt. In this arrangement the clamp-nut d^3 is employed, but, as is obvious, the journal-tube *d* is omitted. In the arrangement shown in Fig. 7 the construction differs from that shown in Fig. 6 in that the binding-nut d^3 is omitted and the bolt is screwed home against the inner end of the tube *d'*, whereby the set-screw may be brought to bear upon the unthreaded part of the bolt.

The journal-tube d of Fig. 5 and the nipples or tubes d^5 of Figs. 6 and 7 are preferably made integral with a coupling-sleeve d^6, employed for detachably connecting together the two parts of the arm B lying at opposite sides of the center of rotation.

Supported in any suitable manner concentric with the journal is a disk E, which represents or is symbolical of the sun.

The standard A near the base-plate is provided with a semicircular lateral bend F, which is adapted to permit the globe-ring to pass without interference. It will be observed that with this bend F and the similar bend b^2 in the globe-carrying arm the said arm and the standard may be brought close together, thus contributing to compactness and stability, and the globe will be caused to bodily rotate approximately in the same vertical plane with the sun-disk. Supported detachably and adjustably upon the standard is an acetylene-lamp G, whose burner-tube g' extends up under the journal and is provided with two burner-tips g^2, one at each side of the journal. With this illuminating device the apparatus may be used in the night-time or in a dark room, the gas-jets representing the sun.

In order that the apparatus may be packed in a small compass for shipment and storage, the parts are made detachable—that is to say, the legs are made to fold without detaching from the base-piece, the base-piece detachable from the standard, the lamp from the standard, the globe-carrying arm from the standard, the globe-ring from the swinging arm, and the standard and the swinging arm may be made of several pieces of tubing connected together by suitable couplings.

It will be observed that with the construction described the globe may be revolved around the sun symbol, its orbit describing a circle around said symbol and showing the perihelion and aphelion by going over and under the sun symbol in an upright or perpendicular revolution, the globe or earth keeping its axis properly inclined at every point in the orbit, thus showing the cause of the change of the seasons and the variations in the length of day and night. It will also be observed that by attaching an earth or globe carrying ring adjustably to its hanger and supporting the hanger pendent fashion the axis of the earth may be adjusted to any desired inclination or perpendicular to the plane of the earth's orbit or the ecliptic.

It will be noted that by making the globe pendent from the extreme end of its carrying-arm the globe will be caused to describe a circle around the sun symbol whose center is at a point below said sun symbol, so that when the globe is vertically over the sun-symbol it will be at its nearest point to said symbol and will therefore be at the perihelion point of its orbit and that when it is vertically under the sun symbol the globe will be at the aphelion point of its orbit, which is farther from the sun than the perihelion point by a distance equal to the diameter of the globe. In this way a substantially correct physical illustration of the causes of the changes in the seasons will be given. It will be observed also that by means of the counterweight and the friction-screw at the journal the earth-carrying arm may be readily rotated and may be stopped and allowed to rest at any point in its rotation; furthermore, that the two lights or gas-jets at the center of rotation afford a practical imitation of the sun when the apparatus is used in a darkened room, the rays of light from these burners illuminating one-half of the globe at every point in its orbit and showing each pole alternately in light and darkness for six months.

It will be obvious that various changes in details of construction may be made without departing from the spirit of this invention, and I desire it understood that I do not limit myself to the exact features of construction shown and described.

What I claim, and desire to secure by Letters Patent, is—

1. In a tellurian, the combination of a standard, a vertically-rotating arm pivotally supported on the standard, a sun symbol at the center of rotation of the arm, and a globe frame or ring pivotally swung from the free end of said arm, so that said ring or frame shall at all points in its rotation depend from the end of said arm, and a globe pivotally supported in this frame, whereby the rotation of the arm will cause the globe to describe a circle around the sun symbol whose center is at a point below the center of said symbol, and the globe may at the same time have an independent rotation on its own axis, for the purposes set forth.

2. In a tellurian, the combination of a standard, an arm supported on a horizontal journal supported in the upper end of said standard, whereby said arm shall have a rotation in a vertical plane, a counterweight at one end of said arm, a pendent globe freely swung from the other end of said arm, a sun symbol at the center of rotation, an adjustable friction device at the journal for checking the rotation of the arm so that it may be stopped at any point in the orbit that the earth describes.

3. In combination with a standard, an arm supported on a horizontal journal supported in the standard, a globe-ring carrying a pivoted globe, a hanger pivotally suspending said globe-ring from the end of said arm, so that the globe-ring shall swing freely vertically but shall have no appreciable lateral swing or oscillation.

4. The combination, a standard, a vertically-swinging arm journaled thereon, a hanger pivotally depending from one end of said arm, a globe-ring adjustably connected to said hanger, and a globe pivoted within said ring, for the purposes set forth.

5. The combination, a standard having a

lateral bend near its lower end, a vertically-swinging arm supported on a horizontal journal supported in the upper end of the standard, a counterweight at one end of said arm and a pendent globe swung from the other end of said arm so as to always hang vertically from its pivotal point, said arm having a lateral bend formed in it adjacent to the globe, said bend and the bend in the standard being for the purpose of permitting the globe and its frame to pass the standard and the arm without obstruction during rotation.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 5th day of September, 1902.

EVAN P. GRAM.

Witnesses:
JAMES RYAN,
DONALD MCCORMICK.