No. 806,839. PATENTED DEC. 12, 1905.

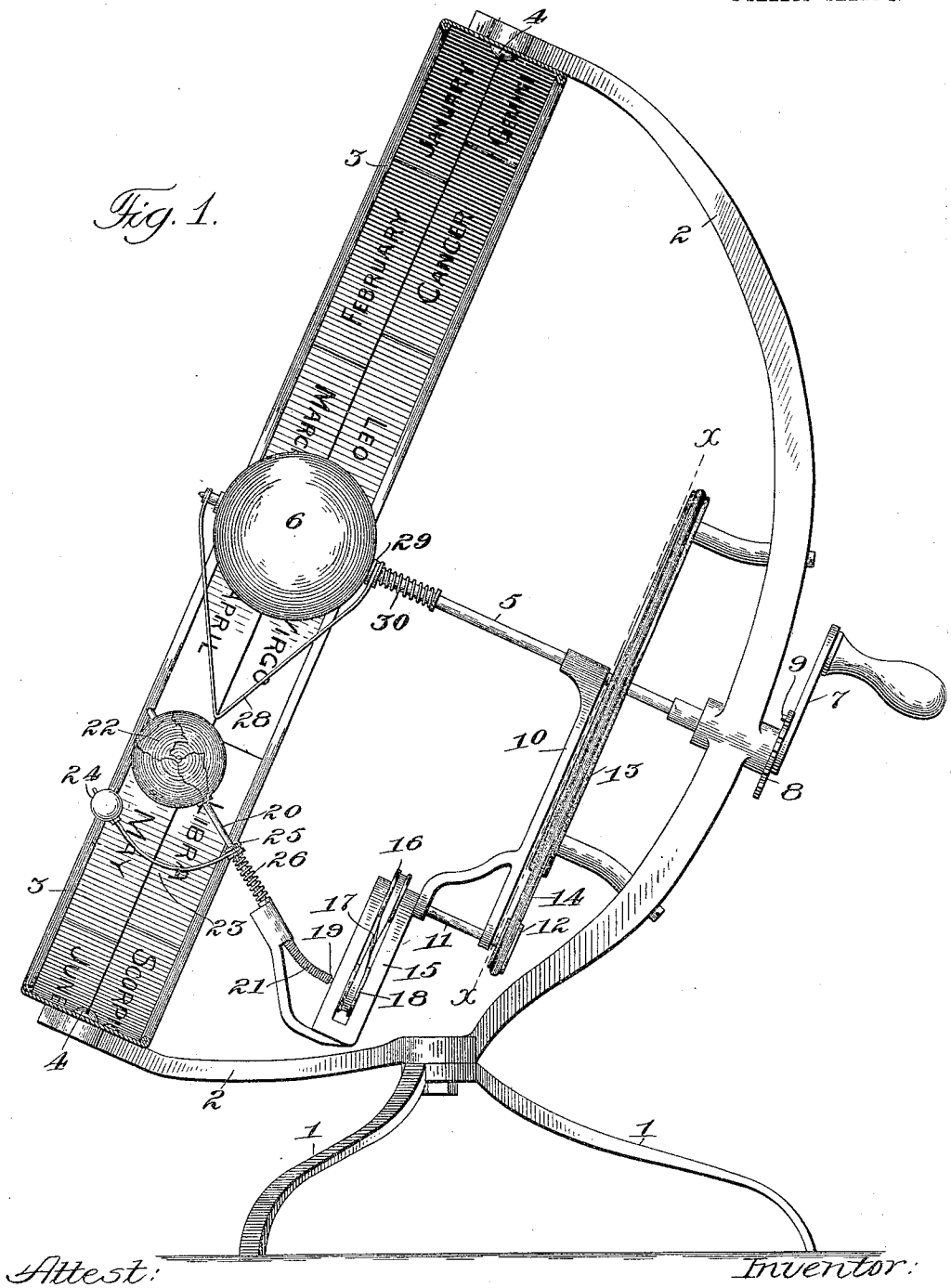
J. E. REMPE.

TELLURIAN.

APPLICATION FILED MAY 19, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

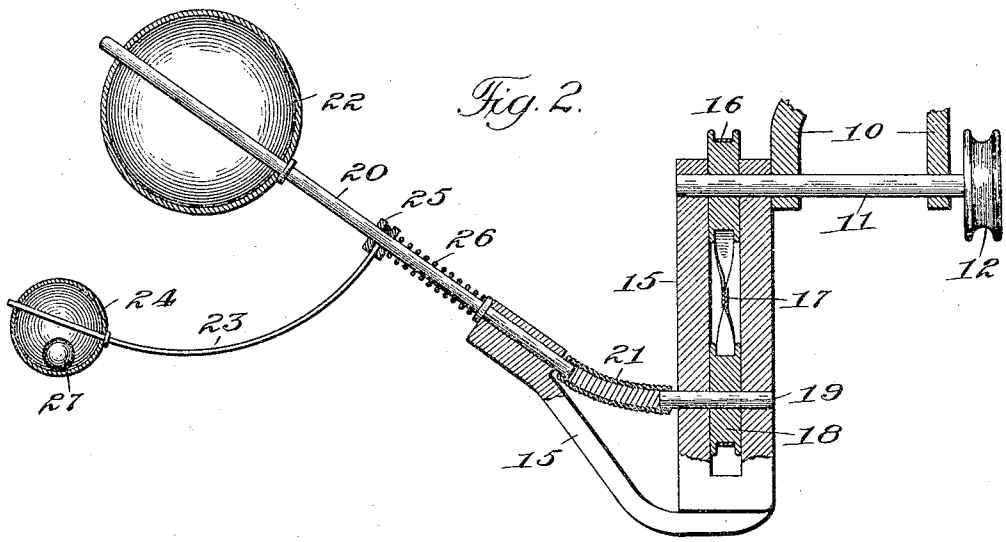


Fig. 3.

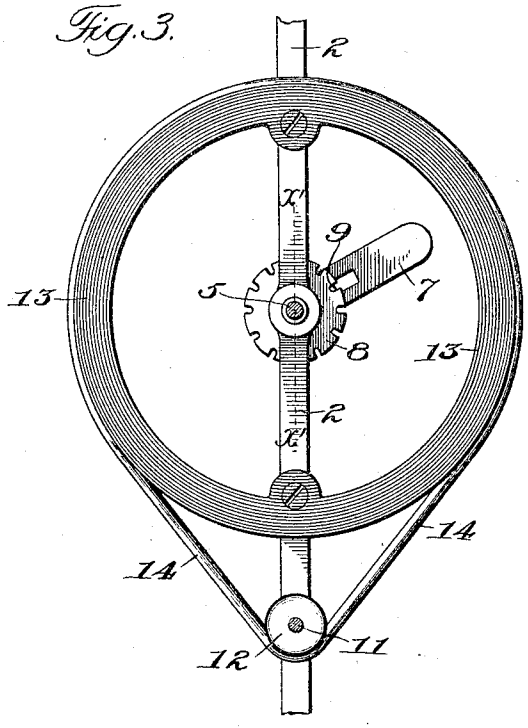
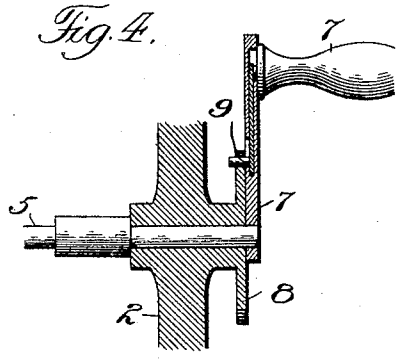


Fig. 4.



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UNITED STATES PATENT OFFICE.

JACOB E. REMPE, OF KANKAKEE, ILLINOIS, ASSIGNOR OF ONE-HALF TO MARGARET M. WALSH, OF KANKAKEE, ILLINOIS.

TELLURIAN.

No. 806,839. Specification of Letters Patent. Patented Dec. 12, 1905.

Application filed May 19, 1905. Serial No. 261,128.

To all whom it may concern:

Be it known that I, JACOB E. REMPE, a citizen of the United States of America, and a resident of Kankakee, in the county of Kankakee and State of Illinois, have invented certain new and useful Improvements in Tellurians, of which the following is a specification.

This invention relates to that class of apparatus employed in the study of astronomy and known as "tellurians," "orreries," and "planitariums," and has for its object to provide a simple, durable, and efficient structural formation and combination of parts adapted for use in the convenient and ready illustration of the movements of the earth and the moon with relation to the sun to cause the successions of day and night, the changes of the seasons, the vernal and autumnal equinoxes, the phases of the moon, and the signs of the zodiac, all as will hereinafter more fully appear, and be more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, with the zodiac-band in section, of a tellurian embodying the present improvements. Fig. 2 is an enlarged detail longitudinal section illustrating the relative arrangement of the earth and the moon spheres and their intermediate connections. Fig. 3 is a detail transverse sectional elevation at line $x\,x$, Fig. 1. Fig. 4 is a detail longitudinal section at line $x'\,x'$, Fig. 3.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 is the supporting-base or tripod, to which the vertically-arranged semicircular frame 2 is secured to constitute a support for the parts and mechanism of the present apparatus.

3 is the usual circular zodiac-band carried by the frame 2. Such band is sixteen degrees wide and is divided into twelve parts of thirty degrees each, called "signs." The inside of such band is divided and named in the same way to represent the constellations, with the months to coincide with the constellations and signs, and are named in the order of their position as follows: "Aries," "Taurus," "Gemini," "Cancer," "Leo," "Virgo," "Libra," "Scorpio," "Sagittarius," "Capricornus," "Aquarius," and "Pisces," the stripe in the center of inside of the band representing the earth's ecliptic. In the present improvement such zodiac-band will be secured in an inclined position to the frame 2 by pivot pins or screws 4, passing through its respective upper and lower sides and through the respective ends of the frame 2, as illustrated in Fig. 1, and so that the band is capable of pivotal movement on said pins to one side or the other with a view to afford a clearer view of the movements of the planets in observing or demonstrating the movements of the same.

5 is the main or central operating-shaft, journaled in the frame 2, with its axis intersecting the axis of the zodiac-band and carrying at such intersecting-point a sphere 6 to represent the sun.

7 is a handle or crank at the rear end of the shaft 5 for convenience in imparting a rotary adjustment to the same by hand.

8 is a fixed circular disk on the frame 2 in concentric relation to the shaft 5 and provided with a series of peripheral notches for engagement with the latch-bar of the operating-handle.

9 is a latch-bar moving in the handle 7 and adapted for engagement with the peripheral notches of the disk 8 to secure the main shaft 5 at any desired point in its rotary adjustment.

10 is a bar or arm fixed at right angles to the main shaft 5, so as to turn therewith.

11 is an intermediate shaft journaled at the outer end of the bar or arm 10 in parallel relation to the main shaft 5 and provided with a small sheave 12 at its rear end.

13 is a large companion sheave secured to the main frame 2 in concentric relation to the main shaft 5 and operatively connected to the small sheave 12 by an elastic endless cord or bolt 14. The arrangement is such that in an orbital movement of the shaft 11 around the main shaft 5 a rotary motion on its own axis will be imposed upon the said shaft 11.

15 is a pendent frame loosely mounted on the forward end of the shaft 11 and weighted to maintain a depending position regardless of the rotation of such shaft.

16 is a sheave at the forward end of the shaft 11, adapted for operative connection by a cross-belt 17 with a companion sheave 18, journaled in the free end of the pendent frame 15 by a shaft 19, as shown in Figs. 1 and 2.

20 is an auxiliary shaft journaled at the

free end of the pendent frame 15 in an angular direction to the shaft 19 aforesaid and operatively connected thereto by a flexible or like universal couping 21, so that the two shafts will rotate in unison.

22 is a sphere representing the earth and mounted on the free end of the shaft 20 as its axis and so that said axis will be at twenty-three and one-half degrees to the plane of the earth-sphere's orbit.

23 is a curved arm secured to the shaft 20 in the adjustable manner hereinafter described and carrying at its outer end a sphere 24 representing the moon.

25 is a fixed collar on the shaft 20, against which the hub portion of the arm 23 is held in frictional engagement by a spring 26, surrounding said shaft, and the arrangement is such that said arm will normally move with the shaft and yet be capable of independent manual adjustment by the operator in making some of the ordinary astronomical demonstrations with the apparatus. For a like purpose the different spheres heretofore referred to will be capable of independent manual turning adjustment on their respective carrying-shafts.

The moon sphere 24 is yieldingly held from rotation on its carrying-arm 23 by an overbalance weight or ball 27, arranged in its interior, as shown in Fig. 2. Such arrangement admits of a manual turning of the sphere and the subsequent maintenance thereof in such set position with relation to the earth sphere 22.

28 is a loop-shaped pointer attached in a manually-rotatable manner to the main shaft 5 and capable of adjustment with relation to the sun sphere 6, as required in demonstrating various astronomical problems by the operator.

29 is a fixed collar on the shaft 5, against which the inner hub of the pointer 28 is held in frictional engagement by a spring 30, surrounding said shaft. Such construction is adapted to cause said pointer to normally move with the sun sphere 6 and still be capable of independent manual adjustment, as before set forth.

By turning the crank 7 the sphere 22, representing the earth, is caused to move in an orbital path around the center sphere 6, representing the sun, to show the yearly motion of the earth. At the same time the sphere 22 rotates on its axis to show the earth's daily motion and illustrate the causes of day and night, sunrise and sunset, long and short days, change of seasons, day and night at the north and south poles, conjunctions, retrograding movements of the planets, the midnight sun, the vernal and autumnal equinox, summer and winter solstice, the horizon, and the zones.

By placing the earth sphere 22 in the beginning of the constellation Virgo on the 20th day of March the sun will enter the sign Aries, the sun's rays, as indicated by the pointer 28, will fall on the equator, and both the earth's poles will be exposed to the sun, which illustrates the vernal equinox.

Turning the earth sphere 22 to the 20th of June in the beginning of the constellation Sagittarius the sun will enter the sign Cancer, the sun's rays, as indicated by the pointer 28, falling on the Tropic of Cancer. This point is called the "summer solstice."

Turning the earth sphere 22 past the constellations Capricornus Aquarius to the beginning of the constellation Pisces on September 20 the sun will enter the sign Libra, the sun's rays falling vertically on the equator again, which causes day and night of equal length all over the globe. This is termed the "autumnal equinox."

Advancing the earth sphere 22 to December 20 it will enter the constellation Gemini, the sun will be in the sign Capricornus and vertically over the Tropic of Capricorn, south of the equator, leaving the north pole in darkness and the south pole in the light of the sun. This point is termed the "winter solstice." Advancing the earth sphere to the 20th of March and it has made one annual revolution or solar year.

The moon sphere 24 moves in its orbit around the earth sphere 22 as the same turns on its axis to show the various phases and places of the moon in the constellations and signs of the zodiac and makes but one revolution on its axis during the month. One side of the moon sphere 24 is designed to illustrate the side of the moon illuminated by the sun. The designated part may be placed toward the sun sphere 6 and held there by the weight 27.

When the moon is new, it is between the earth and sun. One-fourth of its revolution is its first quarter. On the opposite side of the earth from the sun it is full moon, and as it moves one-fourth farther in its orbit it is third quarter.

By looking from the earth sphere to the moon sphere and on beyond it in a straight line to the zodiac will indicate what sign or constellation the moon is in.

The present appliance is adapted to illustrate the moon's motion around the earth and its various phases and places in the constellations and signs of the zodiac, but is not capable of illustrating the moon's motion in connection with the ecliptic or nodes.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a main shaft journaled in said frame, a sun sphere carried by said shaft, means for rotating said shaft, an arm

carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, and an earth sphere carried on said obliquely-arranged shaft, substantially as set forth.

2. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a main shaft journaled in said frame, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, an earth sphere carried on said obliquely-arranged shaft, a curved arm carried by said shaft, and a moon sphere carried by said arm, substantially as set forth.

3. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a main shaft journaled in said frame, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, an earth sphere carried on said obliquely-arranged shaft, a curved arm yieldingly secured to said shaft, and a moon sphere carried by said arm, substantially as set forth.

4. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a main shaft journaled in said frame, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, an earth sphere carried on said obliquely-arranged shaft, a curved arm carried by said shaft, a moon sphere mounted on said arm, and a shifting weight arranged inside of said moon sphere, substantially as set forth.

5. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a main shaft journaled in said frame, a sun sphere carried by said shaft, a loop-shaped pointer adjustably attached to the main shaft adjacent to the sun sphere, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured at the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the

pendent frame, and an earth sphere carried on said obliquely-arranged shaft, substantially as set forth.

6. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a main shaft journaled in said frame, a sun sphere carried by said shaft, a handle for rotating said shaft, a peripherally-notched disk carried by the main frame, a latch-bar carried by the handle and engaging said disk, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, and an earth sphere carried on said obliquely-arranged shaft, substantially as set forth.

7. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a circular zodiac-band secured to said frame, a main shaft journaled in said frame in axial relation to the zodiac-band, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, and an earth sphere carried on said obliquely-arranged shaft, substantially as set forth.

8. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a circular zodiac-band secured to said frame, a main shaft journaled in said frame in axial relation to the zodiac-band, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, an earth sphere carried on said obliquely-arranged shaft, a curved arm carried by said shaft, and a moon sphere carried by said arm, substantially as set forth.

9. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a circular zodiac-band secured to said frame, a main shaft journaled in said frame in axial relation to the zodiac-band, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, an earth sphere carried on said obliquely-arranged shaft, a curved arm yieldingly secured to said shaft, and a moon sphere carried by said arm, substantially as set forth.

10. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a circular zodiac-band secured to said frame, a main shaft journaled in said frame in axial relation to the zodiac-band, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves se-

cured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, an earth sphere carried on said obliquely-arranged shaft, a curved arm carried by said shaft, a moon sphere mounted on said arm, and a shifting weight arranged inside of said moon sphere, substantially as set forth.

11. In a tellurian of the type herein described, the combination of a supporting-base, a vertical frame semicircular in form secured to said base, a circular zodiac-band secured to said frame in a pivotal manner, a main shaft journaled in said frame in axial relation to the zodiac-band, a sun sphere carried by said shaft, means for rotating said shaft, an arm carried by said shaft, an intermediate shaft journaled at the free end of said arm, sheaves secured to the respective ends of the intermediate shaft, a fixed sheave secured to the main frame in concentric relation to the main shaft, an elastic endless belt connecting the sheave at the rear end of the intermediate shaft with the stationary sheave aforesaid, a pendent frame loosely mounted on said intermediate shaft, a shaft journaled at the free end of said pendent frame, a sheave on said shaft, a crossed belt connecting said sheave and the sheave at the forward end of the intermediate shaft, a shaft journaled at the free end of the pendent frame in an oblique position, a flexible connection between said shaft and the other shaft journaled in the pendent frame, and an earth sphere carried on said obliquely-arranged shaft, substantially as set forth.

Signed at Kankakee, Illinois, May, 1905.

JACOB E. REMPE.

Witnesses:

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E. S. GRAY,