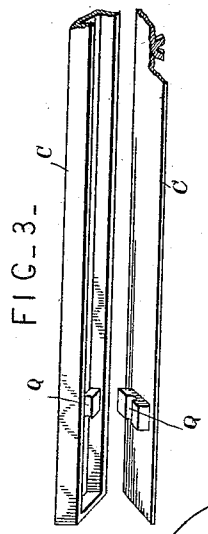
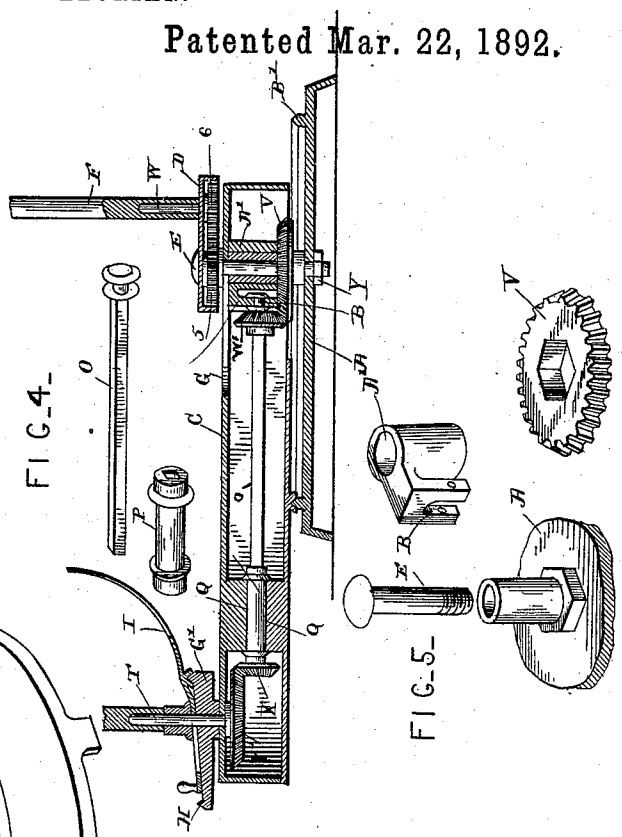
(No Model.)

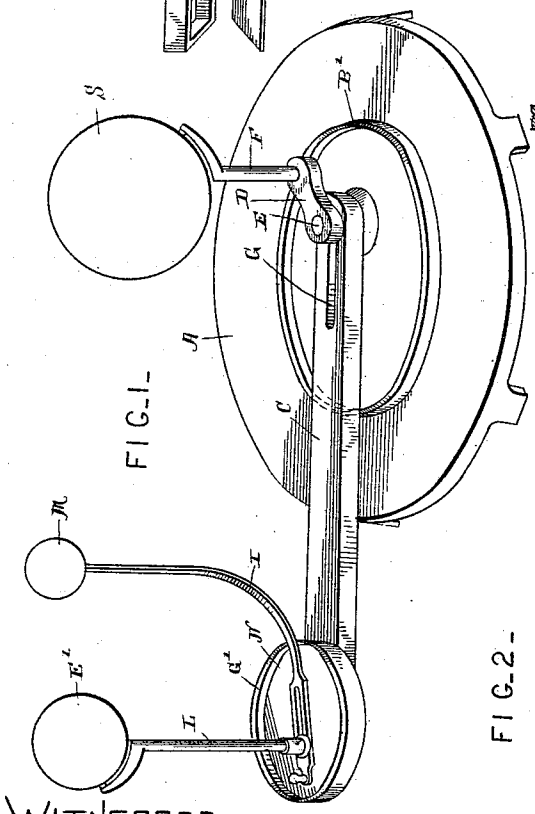
J. L. RITER & J. M. ALFORD.

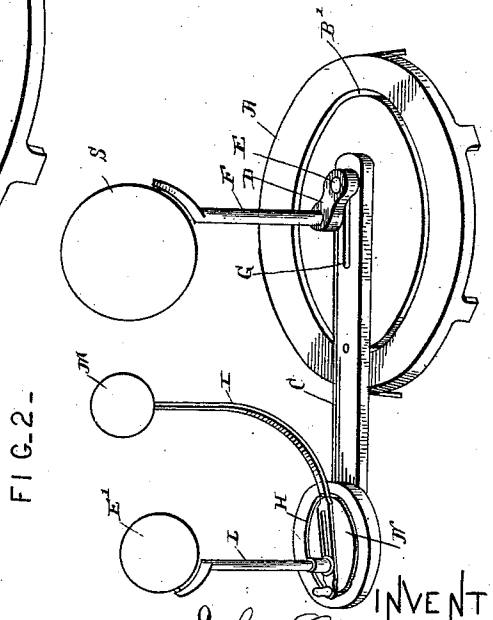
TELLURIAN.

No. 471,524. Patented Mar. 22, 1892.









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UNITED STATES PATENT OFFICE.

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TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 471,524, dated March 22, 1892.

Application filed March 30, 1891. Serial No. 387,070. (No model.)

To all whom it may concern:

Be it known that we, JOHN L. RITER, of Brownsville, in the county of Union and State of Indiana, and JOHN M. ALFORD, of College Corner, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Tellurians; and we 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to an improvement in tellurians; and it consists in the combination and arrangement of parts which will be more fully described hereinafter, and pointed out in the claims.

The object of our invention is to provide an apparatus for illustrating the motions and the effects of motions of the sun, earth, and moon.

Figures 1 and 2 are perspectives of a tellurian which embodies our invention, a slight change being shown in the construction. Fig. 3 is a detached view of the arm which carries the earth and moon. Fig. 4 is an enlarged vertical section taken through the arm. Fig. 5 is a detached view of the parts used in connection with the axle.

A represents the table or stand, which is preferably made elliptical in form and which forms the main support for all of the other parts. Upon the top of this stand A is formed an elliptical flange B, or an elliptical groove may be made in the surface of the stand, as may be preferred, the one being a substitute for the other. Passing up through this stand A at one side of its center is an axle E, which is secured in position by means of a nut Y upon its lower end and which nut bears against the under side of the stand A. This axle E has the wheel 5 secured to its upper end, and this wheel meshes with a second wheel 6, which is supported by the lower end of the shaft W, which is journaled in the outer end of the arm D, which is pivoted upon the axle E. This arm D revolves around the axle E and has upon its outer end the standard F, which is placed upon the shaft W, as shown, and which standard supports the globe S, which represents the sun. This standard F revolves with the shaft W and has its upper end, to which the sun S is applied, placed at a suitable angle, so as to support it at a corresponding angle. The movement of the arm D around the axle E illustrates the movement of the sun while the earth and the other heavenly bodies are revolving around it. The axle E extends up through a slot G made in the inner end of the arm C, which extends horizontally outward across the stand A for the purpose of supporting the earth, the moon, and the mechanism by which the earth is caused to revolve. This arm is preferably formed of two parts, as shown in Fig. 3, and which have the bearing for the shaft P formed integrally therewith. Also formed upon the under side of the lower part of the arm are two projections, which catch over the elliptical flange B, or which part is provided with a pin or projection, which catches in the groove in the top of the stand, if the groove instead of a flange is used. These projections or the pin serve to cause the arm C to move endwise back and forth in relation to the flange or groove as the arm is caused to sweep around the axle E, and thus describe the ellipse through which the earth passes while revolving around the sun. This arm as it sweeps around over the top of the stand A is compelled to follow the outline of the flange or the groove, and hence the arm C has only enough of an endwise movement to cause its outer end to move in an ellipse, and thus bring the earth E′ in its revolution around the sun nearer to and farther from it, exactly as the earth moves in relation to the sun, and thus illustrates in connection with the inclination of the poles of the earth and the revolution of the earth-shaft the changes of the seasons.

Secured to the axle E and resting upon the top of the stand A is the large beveled gear V, which remains stationary, and which wheel V meshes with the pinion W′, which is secured to the inner side of the shaft O. In order to form a support for the inner end of the shaft O, a sleeve A′ is placed around the axle E, and upon one side of this sleeve A′ is formed the bearing B, as shown in Fig. 5, and in which bearing the inner end of the shaft is journaled. This sleeve serves not only as

a bearing for the inner end of the shaft, but also serves to hold the pinion W′ in contact with the wheel V.

Journaled in the bearings Q, which are formed integrally with the two parts of the arm C, is a short hollow shaft P, which has a pinion X, secured to its outer end and through which the angular shaft O extends. This shaft O is made separate from the shaft P, so that as the arm C is caused to move endwise back and forth by the elliptical flange or groove B the shaft O will move back and forth through the short shaft P. The shaft P, being provided with collars or flanges which catch against opposite ends of the bearing Q, has no other than a rotary movement, while the outer end of the shaft O plays back and forth through it. The pinion X meshes with the large wheel Y′, which is secured to the lower end of the shaft T, which extends up through the outer end of the arm C and through the table G′. Upon the upper end of this shaft T is secured the standard L, which also has its upper end bent or turned at an angle, and upon this bent end the globe E′, representing the earth, is placed at a corresponding angle. The upper surface of the table G^2 is inclined, as shown, and it is provided with an elliptical flange or groove H. Resting upon the top of this table is the slotted end of the arm I, which carries the globe M, which represents the moon, and through which slotted end of the arm I the shaft T passes. If a flange is used upon the outer edge of the table, the arm is provided with projections, which catch upon opposite sides of the flange; but if a groove is used instead of a flange a pin projecting from the under side of the arm catches in the groove. The lower portion of the standard L is either sufficiently enlarged to hold the lower end of the arm down in contact with the top of the table or a special weight or collar may be placed upon the shaft T for this purpose. By causing the arm I to travel down the incline of the rim or flange H the moon is caused to lower itself relative to the earth, and we also cause the moon to recede from the earth. If we cause the arm I to travel up the incline of the rim H, we cause the moon to elevate itself relative to the earth and to approach it. In this manner we illustrate that the moon in some portions of its elliptical orbit around the earth lowers itself relatively to it, and at the same time recedes or travels away from the earth. In this manner we also illustrate that the moon in traveling through other portions of its elliptical orbit around the earth elevates itself relatively to the earth, and at the same time approaches near to it. By this same construction we also illustrate that the moon also retains its same face to the earth in all portions of its orbit around the earth.

The most essential features of our invention are that the main arm C shall engage the elliptical flange or groove of the stand A in such a manner that the arm cannot move lengthwise relative to the flange, while the inner end of the arm C is free to play to and fro on its axis while it is sweeping around the stand, whereby any object that is carried by the arm will travel in an elliptical orbit. By having the arm D to rotate upon its axis E the sun is made to travel in an orbit around its axis, thereby illustrating that the sun rotates around a point that is always within the sun's volume, and this point represents the center of gravity of the solar system. By having the upper end of the standard F placed at an inclination we illustrate that the axis of the sun is inclined relatively to the axis of the earth that revolves around it. If the zodiacal belt is properly delineated upon the stand A, the earth will travel around the zodiacal belt when the arm C makes a complete revolution around the sun.

Having thus described our invention, we claim—

1. A stand or support having an elliptical flange or groove, combined with an arm slotted at its inner end and provided with means for engaging said flange or groove, said arm carrying at its outer end representations of the earth and moon, substantially as described.

2. The moon-table having an inclined top, an elliptical flange on the upper face of the table, a vertical earth-support situated eccentrically on said table, and a moon-supporting arm which engages the said flange and which has a slotted lower end through which the said vertical support passes, whereby the moon is adapted to be revolved around the earth and its vertical and lateral position changed in relation thereto, substantially as shown and described.

3. The moon-table having an inclined top surface and provided with an elliptical flange or groove, combined with the slotted arm which supports the moon, and provided with means for engaging with the flange or groove, substantially as set forth.

4. In a tellurian, a base provided with an elliptical flange, a vertical axle, an arm adapted to move around on the said flange and also horizontally on the vertical axle, an earth-supporting standard on the outer end of the arm, a gear-wheel secured to the said standard, a fixed gear-wheel secured to the said vertical axle, and an extensible shaft provided with pinions at its ends, which engage the said gear-wheels, the parts being combined to operate substantially as shown and described.

5. In a tellurian, a base, a vertical axle secured thereto, gear-wheel V, mounted on the vertical axle, a horizontal arm, a globe-supporting standard on the outer end of the arm, wheel Y′, secured to the said standard, a horizontal shaft provided with pinions at its opposite ends, which engage the said wheels, and a sleeve loosely mounted on the vertical

axle, which engages the said shaft, the parts being combined to operate substantially as shown and described.

6. In a tellurian, a base provided with an elliptical flange, a vertical axle, a horizontal slotted arm, projections on the under side of the arm, which engage the said flange, an earth-supporting standard on the outer end of the arm, a gear-wheel secured to the said standard, a gear-wheel secured to the said vertical axle, an extensible shaft provided with pinions which engage the said gear-wheels, a sleeve loosely mounted on the vertical axle and which is provided with a forked projection, and an extension on the inner end of the shaft which bears in the said fork, the parts being combined to operate substantially as shown and described.

7. In a tellurian, a base, a vertical axle, a gear-wheel secured to the vertical axle, a frame adapted to revolve on the said vertical axle, a sun-supporting standard on the said frame, a gear-wheel on the lower end of the said standard, which engages the gear-wheel on the vertical axle, the edges of the said frame being turned down, whereby the gearing is housed, the parts being combined substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN L. RITER.
JOHN M. ALFORD.

Witnesses:
GEO. W. HEIM,
W. R. HALL.