No. 674,768.

Patented May 21, 1901.

A. A. HOYLMAN.

TELLURIAN.

(Application filed Feb. 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.

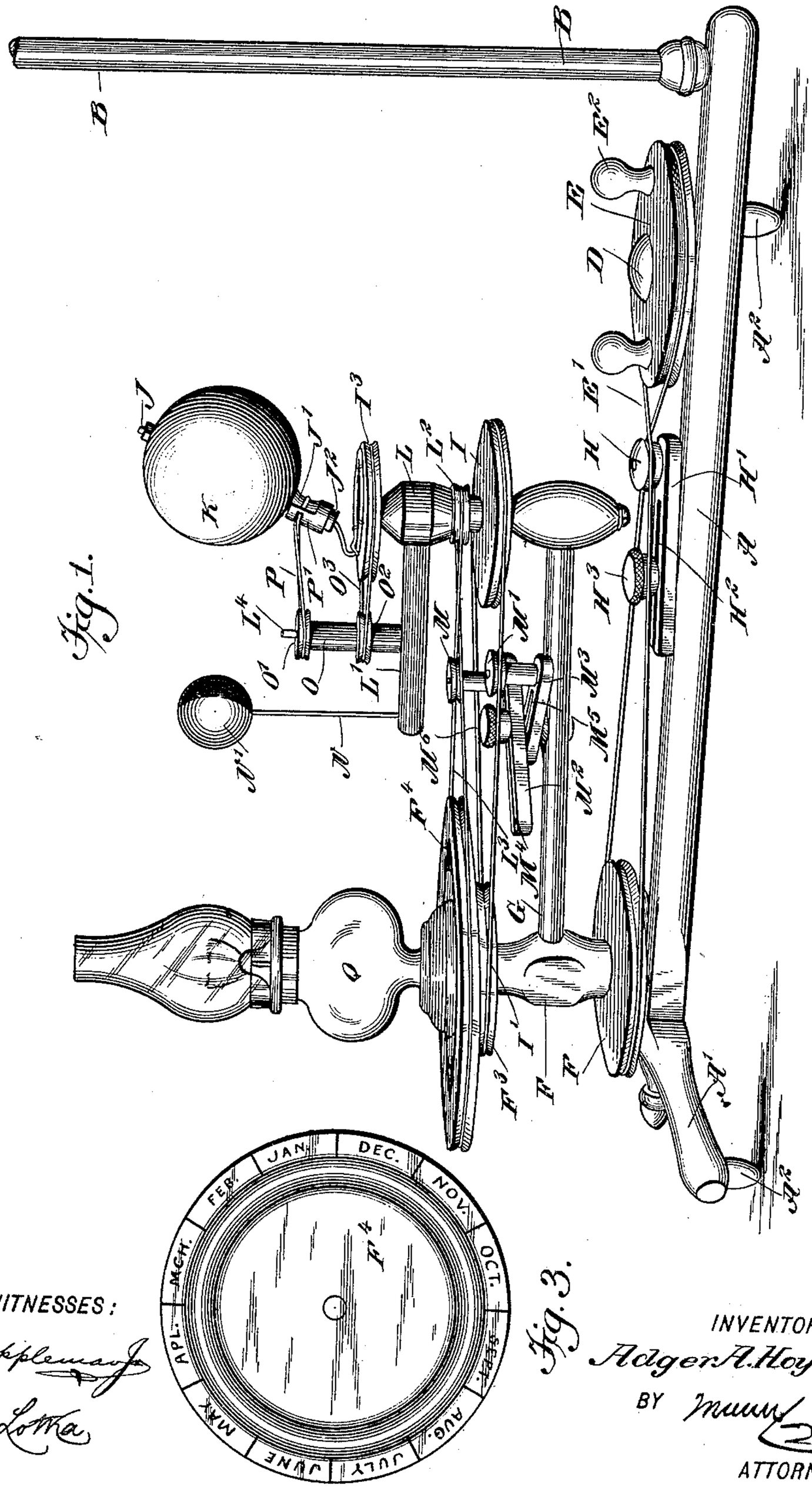

Fig. 1.

Fig. 3.

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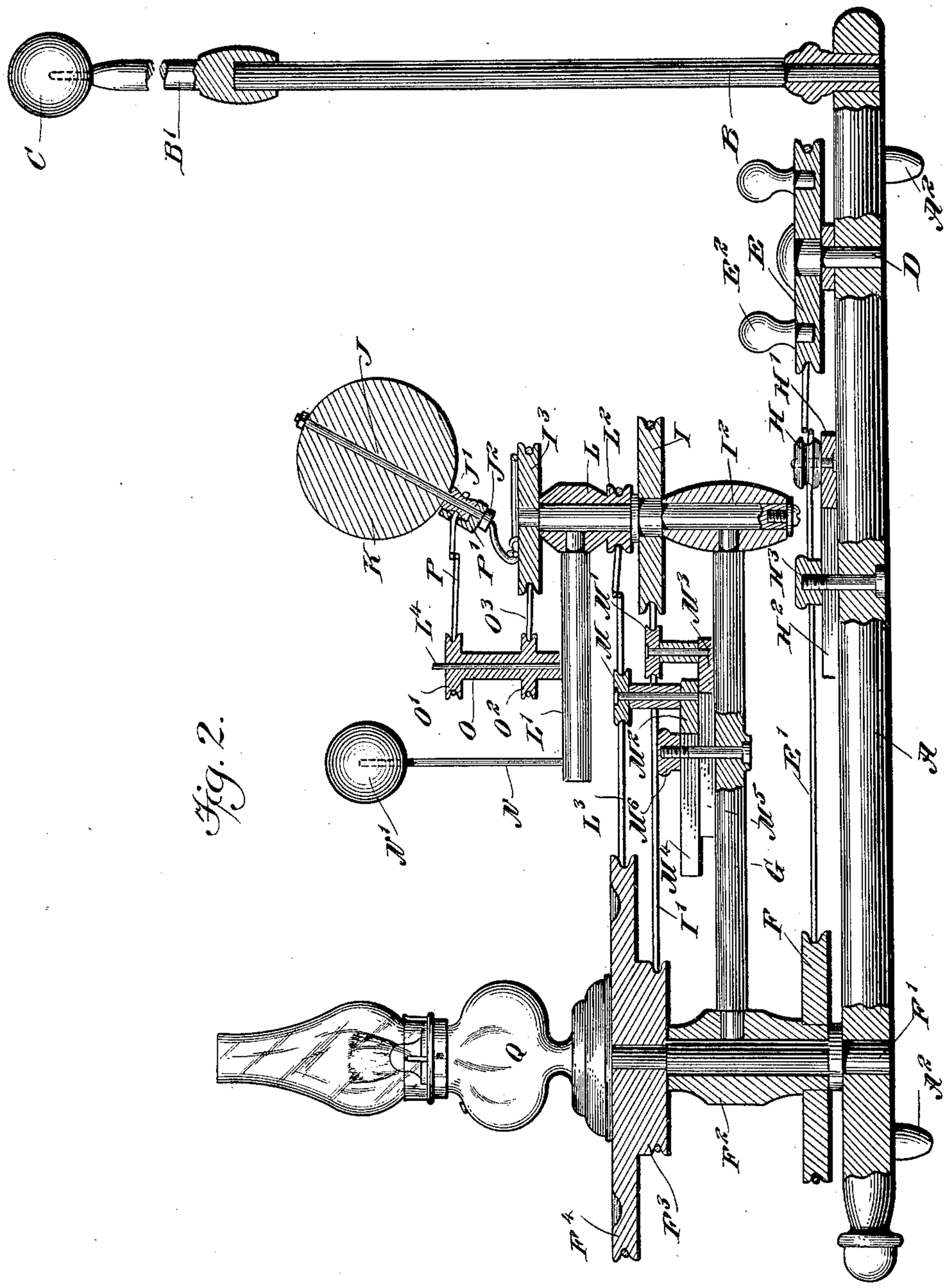
Fig. 2.



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UNITED STATES PATENT OFFICE.

ADGER ANDERSON HOYLMAN, OF ORGANCAVE, WEST VIRGINIA.

TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 674,768, dated May 21, 1901.

Application filed February 15, 1901. Serial No. 47,439. (No model.)

To all whom it may concern:

Be it known that I, ADGER ANDERSON HOYLMAN, a citizen of the United States, and a resident of Organcave, in the county of Greenbrier and State of West Virginia, have invented new and useful Improvements in Tellurians, of which the following is a full, clear, and exact description.

My invention relates to tellurians, and has for its object to provide a device of this class which will be simple in construction, yet capable of clearly illustrating the phenomena connected with the relative motions of the sun, earth, and moon.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of my improved tellurian. Fig. 2 is a central sectional elevation thereof, and Fig. 3 is a plan of the lamp-support which represents the plane of the ecliptic.

The improved tellurian comprises a stationary frame, preferably consisting of a longitudinal bar A and a cross-bar A′, near one end thereof, so that the frame is substantially T-shaped or cross-shaped. Three feet A^2 are generally provided to keep the support level. At one end of the support is located a staff B, preferably provided with a removable upper section B′ and carrying at its top a removable ball C, which represents the north star. The whole staff or its upper section may be used as a pointer. Adjacent to said staff the frame carries a vertical axle D, on which is mounted to rotate the driving-pulley E, connected by a crossed belt or cord E′ with a driven pulley F, loosely mounted upon a stationary vertical axle F′ at the other end of the frame and rigid with a sleeve F^2, from which extends radially an arm G. Between the axles D and F′ the bar A of the frame carries a tension-pulley H, journaled on a slide H′, which is provided with a slot H^2 and may be secured in place after adjustment by means of a screw H^3. The upper end of the axle F′ carries two grooved disks F^3 F^4 of different diameters. The lower disk F^3 is connected by an uncrossed belt or cord I′ with a pulley I, rigidly secured to a vertical shaft I^2, mounted to turn at the outer end of the arm G. To this shaft is further rigidly secured a pulley I^3 of smaller diameter than the pulley I. This upper pulley I^3 carries the inclined axis J, on which is loosely mounted the globe K, representing the earth. The axis J should point toward the north star C. Loosely mounted on the shaft I^2 is a sleeve L, provided with a radial arm L′ and a pulley L^2, both rigid therewith. The pulley L^2 is connected by a crossed belt L^3 with the upper grooved disk F^4. To keep the belts I′ L^3 taut, I provide tension-pulleys M M′, journaled on slides M^2 M^3, slotted at M^4 M^5 to receive the fastening-screw M^6, which secures them to the arm G. The radial arm L′ carries at its free end an upright rod N, with a ball N′ at its upper end, this ball representing the moon and being preferably shaded on one side, as shown in Fig. 1. I find it convenient to make the balls C and N′ of the same size, so that they may be interchanged.

The arm L′ carries a vertical axle L^4, on which is journaled a sleeve O, with superposed pulleys O′ O^2, of which the lower pulley O^2 is connected by a direct belt O^3 with the pulley I^3. The upper pulley O′ is connected by a crossed longitudinally-extensible band P (such as a rubber band) with a pulley J′, loosely mounted on the inclined axis J. Preferably the globe K rests loosely on said pulley J′, the weight of the globe producing sufficient friction to cause it to revolve with the pulley. On the axis J is further loosely mounted a guide P′, having an aperture for the passage of the band P to keep the said band in proper relation to the pulley J′. A stop-collar J^2 on the axis J keeps the guide P′ and pulley J′ at the desired level.

The stationary disk F^4 supports a lamp Q, which represents the sun. This disk, as shown in Fig. 3, may be divided into twelve sections provided with indications of the

months, or instead of these the signs of the zodiac or the names of the respective constellations may be used.

In operation the driving-pulley E is turned by means of handles E^2 projected therefrom, which causes the pulley F to revolve with the sleeve F^2 and the arm G. The latter carries with it the loose pulleys I and L^2, and as these are connected by the belts I′ and L^3 with the stationary disks F^3 F^4, respectively, the pulleys I and L^2 will be caused to rotate on their axes. Inasmuch as the pulley I^3, supporting the globe K, is rigid with the shaft I^2 and with the pulley I, these four parts will move in unison. The pulley I and disk F^3 are made of equal diameters, so that the pulley I will make one revolution for each complete revolution of the arm G. From this it follows that the axis J will always point in the same direction—that is, toward the north star—or the axis will remain parallel to its initial position. The relation of the diameters of the pulley L^2 and disk F^4 is such as to give the sleeve L and arm L′ (and with it the moon N′) about thirteen revolutions for each complete revolution of the arm G. As the arm L′ and pulley I^3 rotate the belt O^3 imparts a rotary motion to the sleeve O and through the medium of the band P turns the pulley J′, which causes the globe K to revolve upon its axis J. In the movement of the balls K and N′ (representing the earth and the moon) the distance between these parts will vary, and this is the reason why I employ a longitudinally-extensible driving connection (as the rubber band P) between the pulleys O′ and J′. The loose guide-sleeve P′ keeps the band P in proper relation to the pulley J′.

I do not aim to correctly represent with my apparatus all the complex phenomena of the earth's and moon's motions, as my chief object has been to produce a simple apparatus enabling a teacher to explain to pupils the main fundamental facts of astronomy, such as the inclination of the earth's axis to its orbit—that is, to the plane of the ecliptic—the rotation of the earth upon its axis and the alternation of day and night for different longitudes and latitudes and at different seasons of the year, the revolution of the earth around the sun and the parallelism of the earth's axis to itself during such motion, the change of seasons, the revolution of the moon around the earth and its relation (in time) to the revolution of the earth around the sun, the fact that the moon always presents the same face to the earth, the phases of the moon, the conditions (approximately) under which eclipses of the sun and of the moon occur, and various other phenomena, as will be obvious to anybody familiar with astronomy.

Modifications as long as they remain within the scope of the appended claims will constitute no departure from the nature of my invention.

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

1. A tellurian comprising a frame adapted to carry a representation of the sun and provided with a stationary grooved disk, an arm rotatably mounted on said frame, a shaft journaled in said arm and carrying a representation of the earth, a pulley loosely mounted on said shaft, a flexible member extending around said pulley and the stationary disk, another arm rigid with said pulley and carrying a representation of the moon, a second pulley journaled on said second arm, a third pulley rigid with said shaft, a flexible member extending around said second pulley and the pulley rigid on the shaft, a fourth pulley coaxial and rigid with the second pulley, a fifth pulley mounted on the earth's axis to turn with the earth, a flexible connection between the said fourth and fifth pulleys, and means for preventing a rotation of the shaft relatively to the frame as the earth-carrying arm revolves, so as to keep the earth's axis in parallelism.

2. A tellurian comprising a frame adapted to carry a representation of the sun and provided with a stationary grooved disk, an arm rotatably mounted on said frame, a shaft journaled in said arm and carrying an inclined axis with a representation of the earth supported thereon rotatably, a pulley loosely mounted on said shaft, a flexible member extending around said pulley and the stationary disk, another arm rigid with said pulley and carrying a representation of the moon, a second pulley journaled on said second arm, a third pulley rigid with said shaft, a flexible member extending around said second pulley and the pulley rigid on the shaft, a fourth pulley coaxial and rigid with the second pulley, a fifth pulley mounted on the earth's axis to turn with the earth, a flexible, longitudinally-extensible connection between the said fourth and fifth pulleys, and means for preventing a rotation of the shaft relatively to the frame as the earth-carrying arm revolves, so as to keep the earth's axis in parallelism.

3. A tellurian comprising a frame adapted to carry a representation of the sun and provided with a stationary grooved disk, an arm rotatably mounted on said frame, a shaft journaled in said arm and carrying a representation of the earth, a pulley loosely mounted on said shaft, a flexible member extending around said pulley and the stationary disk, another arm rigid with said pulley and carrying a representation of the moon, a second pulley journaled on said second arm, a third pulley rigid with said shaft, a flexible member extending around said second pulley and the pulley rigid on the shaft, a fourth pulley coaxial and rigid with the second pulley, a fifth pulley mounted on the earth's axis to turn with the earth, a flexible connection

between the said fourth and fifth pulleys, a guide loosely mounted on the earth's axis adjacent to its pulley and perforated for the passage of the said flexible member, and means for preventing a rotation of the shaft relatively to the frame as the earth-carrying arm revolves, so as to keep the earth's axis in parallelism.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADGER ANDERSON HOYLMAN.

Witnesses:
F. M. HOYLMAN,
E. W. HOYLMAN.