(No Model.)

J. K. RASSWEILER.

TELLURIAN.

No. 448,075. Patented Mar. 10, 1891.

Fig. 1.

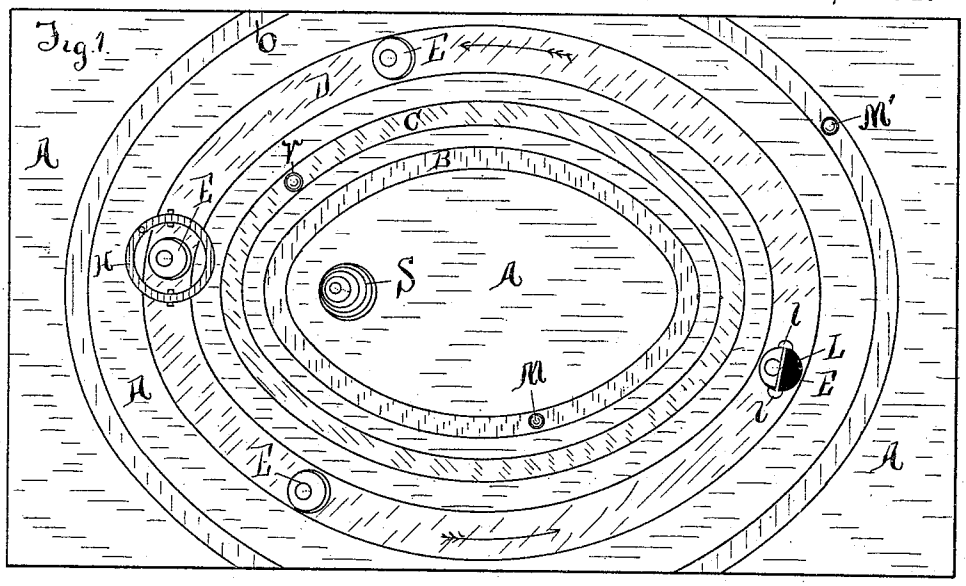


Fig. 2.

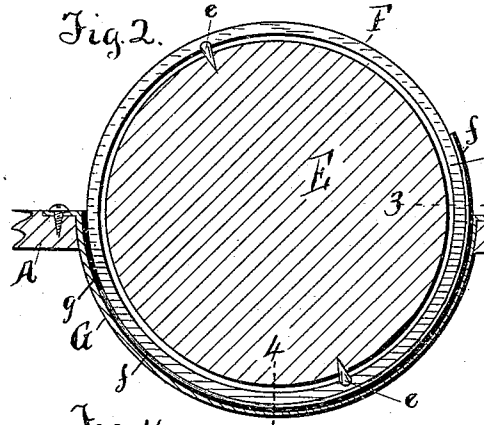


Fig. 3.

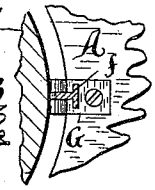


Fig. 4

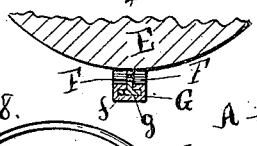


Fig. 5.

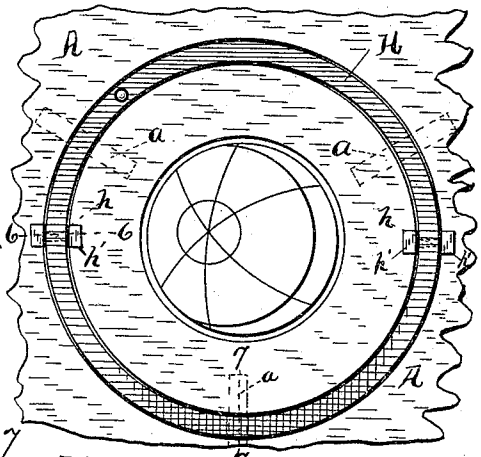


Fig. 6

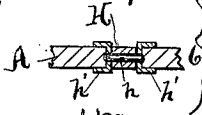


Fig. 8.

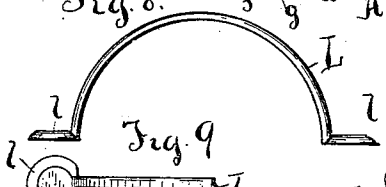


Fig. 9

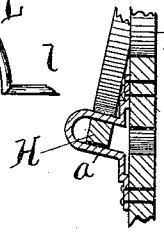


Fig. 7

Witnesses
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By His Atty. H. Bitner

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN K. RASSWEILER, OF WHEATON, ILLINOIS.

TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 448,075, dated March 10, 1891.

Application filed April 16, 1890. Serial No. 348,210. (No model.)

To all whom it may concern:

Be it known that I, JOHN K. RASSWEILER, a citizen of the United States, residing at Wheaton, in the county of Du Page and State of Illinois, have invented certain new and useful Improvements in Tellurians, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of an apparatus embodying my improvements. Fig. 2 is a vertical section of a portion of said apparatus, and is designed to illustrate the preferred means for mounting the spheres. Figs. 3 and 4 are partial vertical sections of Fig. 2 in lines 3 3 and 4 4, respectively. Fig. 5 is an enlarged plan of the portion of the apparatus which contains the orbit of the moon; Figs. 6 and 7, partial vertical sections of Fig. 5 in lines 6 6 and 7 7, respectively. Fig. 8 is an enlarged elevation of the device for marking the circle of illumination, and Fig. 9 is a broken plan of the same device.

The subject of this invention is an apparatus designed for use in studying the positions and motions of the earth, sun, and other heavenly bodies, together with certain important facts relating thereto. The purpose is to provide a simple graphic representation of these bodies and their paths through space, together with means for clearly illustrating their more important phenomena and the laws in accordance with which these phenomena occur. It is desirable in the construction of an apparatus of this sort to avoid all unnecessary complication, and especially intricate mechanical contrivances, which are likely to distract the student's attention and become a greater object of curiosity than the things they are designed to illustrate. Besides, an apparatus which requires the constant attention of a skillful mechanic is entirely out of place in the hands of the average teacher or pupil, who make no pretense of being mechanical experts. For this reason I have endeavored to avoid as far as possible in my apparatus the use of any parts which do not directly represent or illustrate some one of the important facts or features which the apparatus is designed to aid one in studying. To this end I have chosen as the supporting-frame a plane surface, of any suitable material, representing the plane of the earth's orbit, or the "ecliptic," as it is technically called. This is lettered A in the drawings, and may be of any desirable extent to furnish the room required. I have used for purposes of illustration a wooden board large enough to contain representations of four of the planetary orbits. At a convenient point in this board I have cut a circular hole and mounted therein a spherical body S to represent the sun, the center of the sphere being in the plane of the surface of the board. About this sphere are elliptical paths B C D O, distinguished by color or other means from the remainder of the surface, representing in a general way the orbits of Mercury, Venus, earth, and Mars, and at various points in these paths spheres M V E M′ are mounted to represent these planets. As many different positions of each one as is desired can be indicated by providing holes at such places, and the spheres are preferably so mounted therein that they can be readily taken out and placed in any one of the different positions. For the earth I prefer to show at least four positions, so as to include both of the solstices and the equinoxes.

The spheres may be mounted in their respective places in any suitable manner; but as a subordinate improvement a simple device, which is very satisfactory, is shown in Figs. 2, 3, and 4 of the drawings. In these figures the earth (shown in diametrical section) is pivoted at the opposite ends of a diameter by means of pins *e e* to an encircling ring F, so as to rotate freely therein. This ring bears upon its outer edge, and extending half around the same a double flange *f*, making this portion of the ring T-shaped in section, as seen in Figs. 3 and 4, and within the hole in the board A a semicircular guide G is fastened, provided with an internal T-shaped groove *g*, fitted to the flanged ring F. To mount the sphere in position the unflanged portion of the ring is placed within the guide G and the ring then turned, sliding the flange *f* within the groove *g*, where it will be securely held until taken out by a reverse movement. This device gives the sphere a free

rotation upon the axis *e e*, and at the same time enables said axis to be placed at any inclination to the ecliptic.

About the earth, in one or more of its positions, the orbit of the moon is indicated by the circular path H. To show the inclination of this orbit to the ecliptic I cut it out and pivot it at two opposite points *h* upon U-shaped clamps *h' h'*, embracing the adjacent edges of the board A and sliding freely thereon. The portion of the board within the orbit which is cut away is sustained by straps or bridges *a*, spanning the annular slot thus created, and being extended downward at their middle portion to escape the orbit H when depressed within the necessary limit. The planetary orbits may be cut out and pivoted in a similar manner, if desired, though if this were done there would be no particular advantage in the use of the clamps *h' h'* overpivoting directly to the board A, unless these orbits were also made circular, which I should not consider desirable.

Another supplementary improvement is seen at L in Fig. 1 and enlarged in Figs. 8 and 9. This is for the purpose of showing what is called the "circle of illumination"—*i. e.*, the boundary-line between the illuminated and unilluminated portions of the earth's surface. The device consists of a half ring L, provided at each end with supporting plates or feet *l l*, so that it can be easily placed over the earth in any one of its positions and will divide the side toward the sun from the opposite side. This illustration may be made still more satisfactory by having a separate sphere blackened over one hemisphere to make the representation more vivid, and as a still further improvement I add to the apparatus a sphere mounted like the others, but with a "blackboard" surface, which may be made to show the circle of illumination by chalking one hemisphere, and which will also be found of great utility in showing how the limits of the different zones are determined, as the sun's rays may be represented by a piece of chalk, which will trace the different circles as the earth is rotated upon its axis.

My different improvements are capable of either conjoint or separate use, and I do not limit myself to the combination of all or any of them, except as specified in the following claims, wherein I point out

What I believe to be new and desire to secure by Letters Patent—

1. In an apparatus of the class described, the plane surface A, representing the ecliptic, having spheres mounted therein to indicate the positions of the sun and earth, and annular portions H, pivoted thereto by means of the pivots *h* and clamps *h'*, to represent the orbits of the heavenly bodies, together with spheres mounted on said annular portions to represent said bodies, substantially as described.

2. In combination with the ecliptic plane having a sphere properly located therein to represent the sun, a globe supported by the grooved half, ring G, fixed to the ecliptic plane, the flanged ring F, and the pivots *e*, secured to the ring F and supporting said globe, substantially as described.

3. The combination of the spheres representing the earth and moon, the ecliptic plane having the annular portions cut therefrom and pivoted therein, and the bridge-pieces *a*, to unite the parts of the plane on opposite sides of the portions cut away without interfering with the free oscillation of the annular portion, substantially as described.

JOHN K. RASSWEILER.

Witnesses:
J. W. TRAEGER,
H. BITNER.