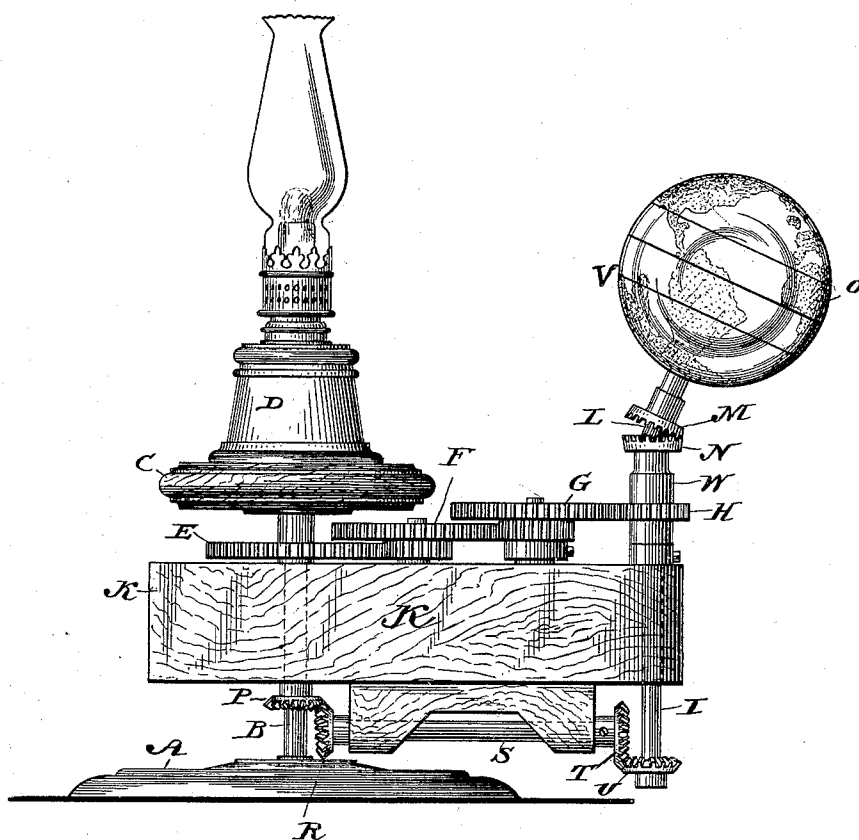


(No Model.)

J. A. BOYCE.
TELLURIAN.

No. 408,335.

Patented Aug. 6, 1889.



Witnesses

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By his

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UNITED STATES PATENT OFFICE.

JAMES A. BOYCE, OF WELLSBOROUGH, PENNSYLVANIA.

TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 408,335, dated August 6, 1889.

Application filed July 31, 1888. Serial No. 281,506. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. BOYCE, a citizen of the United States, residing at Wellsborough, in the county of Tioga and State of Pennsylvania, have invented certain new and useful Improvements in Tellurians; and I 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 appertains to make and use the same.

My invention relates to new and useful improvements in tellurians, or devices for graphically illustrating the change of seasons and the succession of day and night, and is especially designed for use in schools.

In the accompanying drawing, illustrative of my invention, A is the stationary base which supports the device, and B is an upright standard rigidly fixed therein, and provided at its upper end with the table C for the reception of the lamp D, which is used to represent the sun. Loosely mounted upon the standard B is the traveling arm K, and rigidly connected with the said standard is the gear-wheel E, which, through the intermediacy of the train of gears F G, imparts motion to the gear-wheel H, integral with a sleeve W, loosely mounted upon the shaft I. The shaft I is in turn loosely mounted at the outer end of the traveling arm K, and at its upper portion, at I, it is bent twenty-three and one-half degrees from the perpendicular. Upon this upper inclined portion runs freely the beveled gear-wheel M, which meshes with the beveled gear N, integral with the sleeve W and gear H, and which bears upon its lengthened axis the globe O, which is designed to represent the earth. Upon the upright standard B is also rigidly mounted underneath the traveling arm K the beveled gear-wheel P, which, by means of the gear R, shaft S, and gears T and U, imparts motion to the upright shaft I.

The parts being constructed and arranged as described, the operation of my invention is as follows: Motion being given to the arm K in a direction contrary to that of the hands of a watch by simply turning with the hand or by clock-work attachment or other available means, the globe O, through the intermedi-

acy of the train of wheels E, F, G, H, N, and M, is caused to rotate upon its axis in an inverse direction—that is, in the same direction as the earth, from west to east. In the form of my invention illustrated in the drawing each of the three gear-wheels E F G is three times the size of the pinion with which it meshes, so that when one complete revolution of the arm K about the upright shaft B has been made the globe O has rotated upon its axis twenty-seven times. It is obvious, however, that, if preferable, I might employ a train of gearing that would cause the globe to rotate three hundred and sixty-five times with every complete revolution of the arm K, corresponding to the terrestrial year; but for practical purposes the construction illustrated suffices. As the globe O rotates upon its axis the light from the lamp D shines successively upon every portion of it, the hemisphere farthest from the lamp remaining in darkness, so that the succession of day and night is very clearly shown to the pupil. The change of seasons is also as clearly illustrated. When the frame is in the position illustrated in the drawing, the rays of light from the lamp D shine perpendicularly upon the globe along the circle V, which represents the Tropic of Capricorn, twenty-three and one-half degrees south of the equator, so that when the globe is in that position it is at the winter solstice for the northern hemisphere and at the summer solstice for the southern. As the revolution of the arm K is proceeded with, motion is imparted to the shaft I by means of the pairs of beveled gears P R and T U, which are all of the same size, in a right-hand direction, and during one complete revolution of the arm K the shaft I will have also made one revolution. The effect of this is to maintain the axis of the globe O parallel to itself at all points in its orbit and at the same angle with reference to the plane of the arm K. Accordingly a quarter-revolution of the arm K will bring the globe into a position where the rays of light from the lamp D will strike the globe O perpendicularly upon its equator, at which time it is the vernal equinox for the northern hemisphere and the autumnal equinox for the southern hemisphere, and so on through the four seasons.

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

5 A tellurian consisting of a standard A, a fixed post B, mounted thereon and provided with cog-disks P and E, a platform C, mounted on said post for the reception of a lamp D, a swinging arm K, mounted loosely upon the post B intermediate between the cog-disks P
10 and E, a shaft S, mounted in journals connected with said swinging arm K and provided with cog-wheel R, intermeshing with cog-wheel P and a cog-wheel T, a vertical shaft I, mounted in the outer end of the
15 swing-arm K, said shaft being bent at its upper portion to form an angle of twenty-three

and a half degrees, and provided at its lower end with a cog U, intermeshing with the cog T, a sleeve W, provided with a cog H and a crown-wheel N, gearing F G, connecting the
20 cog-wheel H with the cog-wheel E, a globe O, into which the bent portion of the shaft I passes, and a crown-wheel M, intermeshing with the crown-wheel N and connected to said globe.
25

In testimony whereof I affix my signature in presence of two witnesses.

JAMES A. BOYCE.

Witnesses:

F. E. WATROUS,
S. F. CHANNETH.