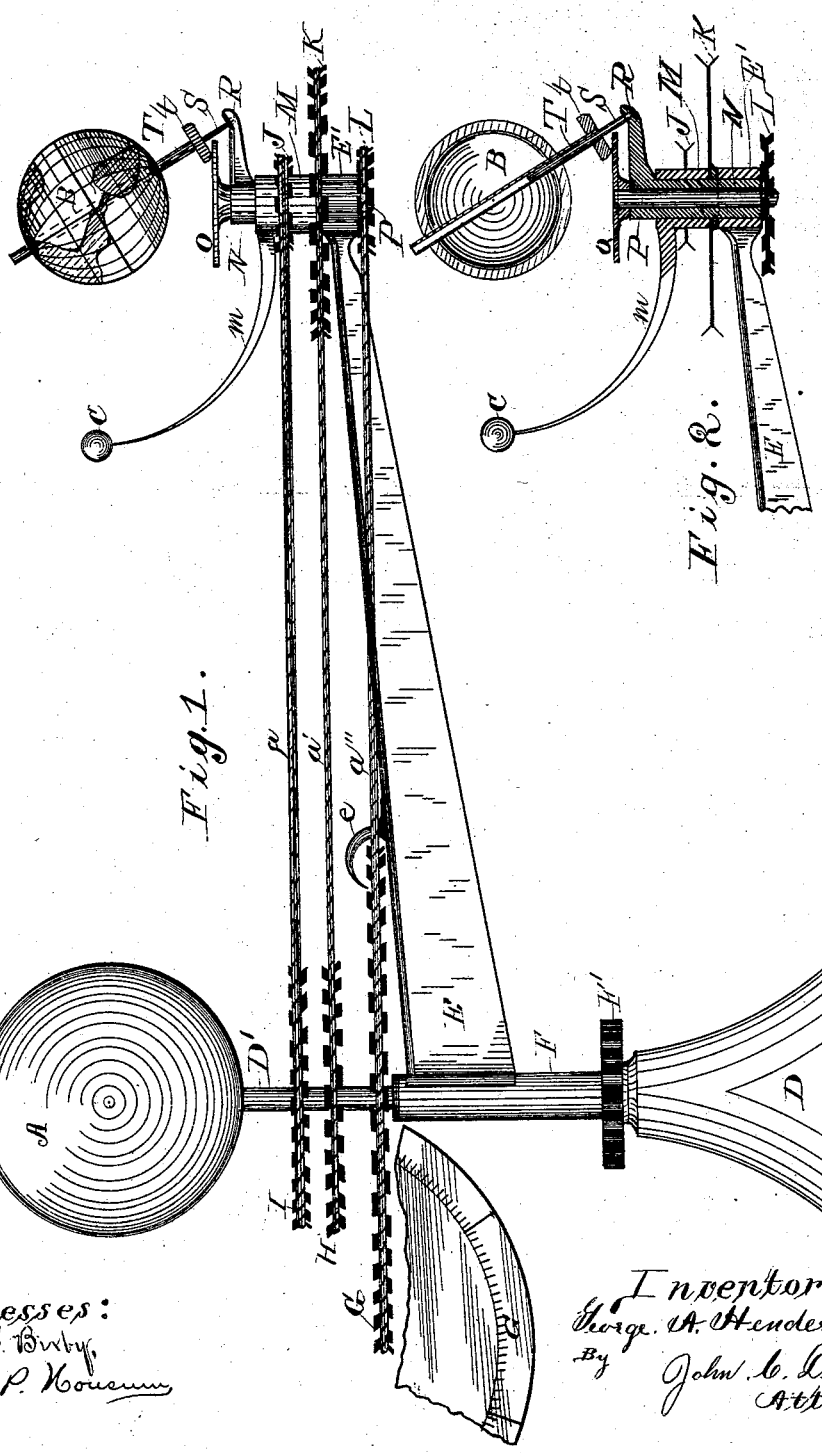
(No Model.)

G. A. HENDERSON.

TELLURIAN.

No. 261,603. Patented July 25, 1882.



Witnesses:
John L. Bixby,
Chas P. Howson

Inventor,
George A. Henderson
By John A. Dupee
Attorney

UNITED STATES PATENT OFFICE.

GEORGE A. HENDERSON, OF DECATUR, ILLINOIS.

TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 261,603, dated July 25, 1882.

Application filed February 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. HENDERSON, a citizen of the United States, residing at Decatur, in the county of Macon and State of Illinois, have invented a new and useful Improvement in Tellurians, of which the following is a specification.

My invention relates to certain new and useful improvements in that class of tellurians which shows the simpler movements of the earth and moon and their attendant phenomena; and it consists of the within-described mechanism for illustrating the revolutions of the earth around the sun, the revolution of the earth on its own axis, the change of the seasons, the precession of equinoxes, movements and phases of the moon, and phenomena of the eclipses, and for the solution of many problems occurring in this branch of study. I attain these objects by the device illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the tellurian complete. Fig. 2 is a sectional view of the mechanism attached to the end of the bracket upon which the globes representing the earth and moon are mounted.

Similar letters refer to similar parts throughout the several views.

A is a gilt globe or ball, representing the sun, and is mounted upon the top of the standard D′, which rises from a pedestal, D, said standard being provided with the fixed band-wheels G, H, and I.

F is a sleeve fitted loosely onto the standard, its lower end resting upon the pedestal, and is provided with a milled head, F′, by means of which it is turned. To one side of this sleeve is secured the bracket E, at the outer end of which is a sleeve or socket, E′, adapted to receive and support the mechanism which operates the earth and moon. Within this socket E′ is fitted to revolve the sleeve N, provided with a band-wheel, K, the hub of which rests upon the upper end of the socket. At the upper end of this sleeve N an arm, R, is secured, provided with a small rod, S, attached to its outer end in an inclined position, to indicate the inclination of the earth's equator to the ecliptic.

The earth-globe B is provided with a tube, T, which is adapted to pass over the rod S, and is provided with a milled head which rests upon the disk O, as shown, so that by a circular movement of the disk O an axial movement is given to the earth.

M is a sleeve fitted so as to revolve around on the sleeve N, between the arm R and wheel K, upon which it rests. The sleeve M is provided with a small band-wheel, J, and a curved arm, *m*, which supports the moon.

P is a small shaft, fitted to revolve within the sleeve N, the upper end of which is provided with a flat disk, O, and its lower end with a small band-wheel, L, on a line with and connected with the lower fixed wheel, G, by a band or cord, *a″*.

The details of construction being described, the operation is as follows: In order, first, to rotate the earth and moon around the sun, the bracket E is moved around the standard surmounted by the sun-globe A by simply turning the milled head F′ with hand either to the right or to the left, as desired. By the sweep of the bracket, all of the mechanism is operated through the medium of the bands *a*, *a′*, and *a″*, connecting with the fixed wheels and the corresponding movable wheels at the end of said bracket. Each individual movement of the earth and moon is obtained as follows: The polar movement is produced by the band *a′*, which passes around the fixed wheel H of the standard, thence around the band-wheel K, which is actuated by the sweep of the bracket, while the arm R, which supports the earth, is in an inclined position, by means of which any given direction of the pole is maintained, its direction being only very slightly varied by the precession of equinoxes, the precession of equinoxes being obtained by a slight difference in the diameter of the band-wheels H and K and by a succession of revolutions of the earth around the sun. The axial movement of the earth is obtained by the band *a″* passing around the fixed wheel G and around the small band-wheel L, secured to the lower end of the shaft P, as shown, and by the circular movement of the arm or bracket E the shaft P and its disk O is revolved, thus causing the earth to revolve upon its own axis through the medium of the milled head *t*, which is secured to the earth-pole in such a manner as to rest upon the disk O, from which it receives its motion.

The moon is revolved around the earth by the band *a* passing around the fixed wheel I and around the smaller wheel J, the band *a* being crossed, so as to produce a circular movement of the moon in reverse direction to the polar movement of the earth.

In order that it may be more clearly understood in what relation the fixed wheels G and H stand to each other and to the movable wheels L and K in producing the three distinct movements of the earth, as hereinbefore described, first, for example, say the band *a''* be thrown off, the sweep of the bracket around the standard will only produce a polar movement of the earth, and not an axial movement; and, again, by replacing the band *a''* and throwing off the band *a'* and moving the bracket as before I still have only a polar movement, as there is no resistance to the circular movement of the sleeve N, to which the axis of the earth is attached, and it is caused to revolve by the friction of the shaft P and the hub of the disk O, which rests upon said sleeve. It will be obvious, therefore, that the fixed wheel H and the movable wheel K perform three distinct functions in connection with G and L, first, in producing a polar movement of the earth; secondly, in affording a resistance against the movement of the mechanism which produces the axial movement of the earth; and, thirdly, by a slight increase in the diameter of the wheel K over the wheel H an illustration of the precession of equinoxes is produced and only made apparent by a succession of revolutions of the bracket E around the sun.

On the upper face of the fixed wheel G are graduations showing the signs of the zodiac, the months and days of the year; and upon the bracket is secured an indicator, *e*, for indicating the position of the earth in the heavens during the different seasons of the year.

The different parts of the apparatus are made removable, so that they may be readily detached from each other and reduced to a compact form for convenience in transportation and storage.

I am aware that tellurians have been constructed in which the earth and moon globes are supported at the extremity of an arm and operated by the rotation of that arm around a central supporting-axis, which also carries the sun-globe or a lamp. I therefore do not claim such construction, broadly.

What I claim, and desire to secure by Letters Patent, is—

1. In a tellurian having pedestal D and fixed standard D', carrying sun-globe A, the combination, with these, of the earth and moon supporting bracket E and sleeve F, provided with milled head F', as shown and described.

2. In a tellurian, the sleeve F, provided with milled head F' and earth-bracket E, having earth and moon globes and operating mechanism at its outer end, and provided with indicator *e*, in combination with pedestal D and standard D', and the stationary graduated band-wheel G and band *a''*, as shown and described.

3. In a tellurian having pedestal D and fixed standard D', supporting sun-globe A, and provided with fixed band-wheels G H, the combination, with these, of the bracket E, projecting from sleeve F, having milled head, and provided with sleeve N, carrying the earth-globe, the shaft P, and band-wheels K L at its outer end, and the bands, *a' a''*, adapted, when the bracket is rotated round the sun-globe, to illustrate, because of the difference in size of wheels H K, the precession of the equinoxes, substantially as shown and described.

4. In a tellurian, the fixed band-wheel G, band *a''*, and standard D', in combination with wheel L and shaft P, the sleeve N, supporting globe B, and the bracket E, sleeve F, and head F', operating to impart by the friction of said shaft and sleeve more rapid polar motion to the earth-globe, whereby an additional set of planetary movements may be illustrated, as and for the purpose specified.

GEO. A. HENDERSON.

Attest:
S. F. GREER,
C. L. WAGGONER.