(No Model.) 2 Sheets—Sheet 1.

O. DOOLEY.

TELLURIAN.

No. 423,036. Patented Mar. 11, 1890.

Fig. 1

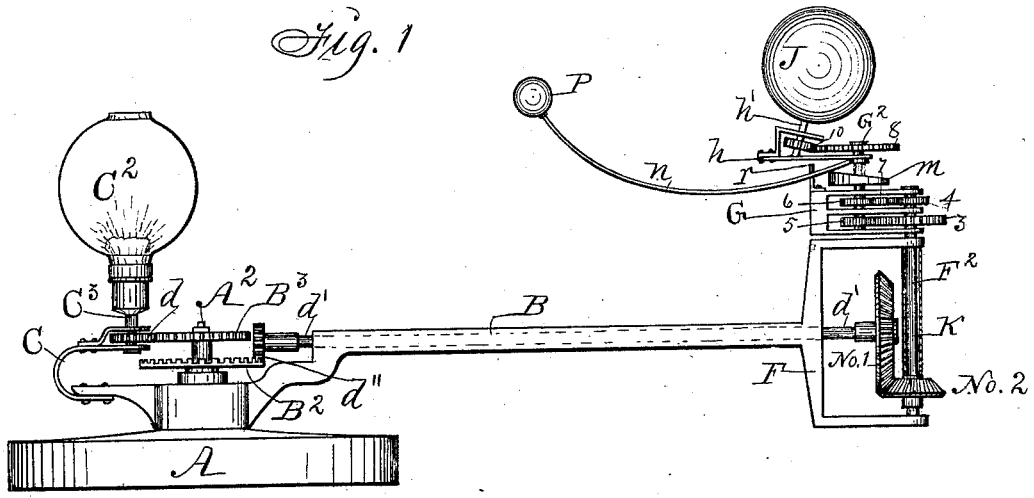


Fig. 2

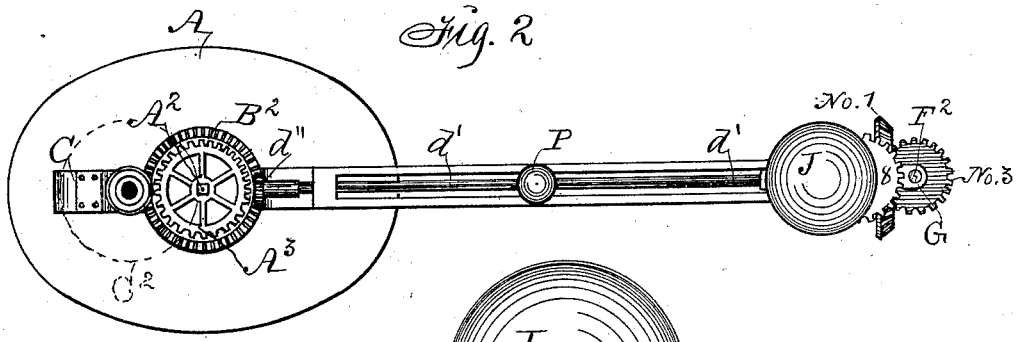
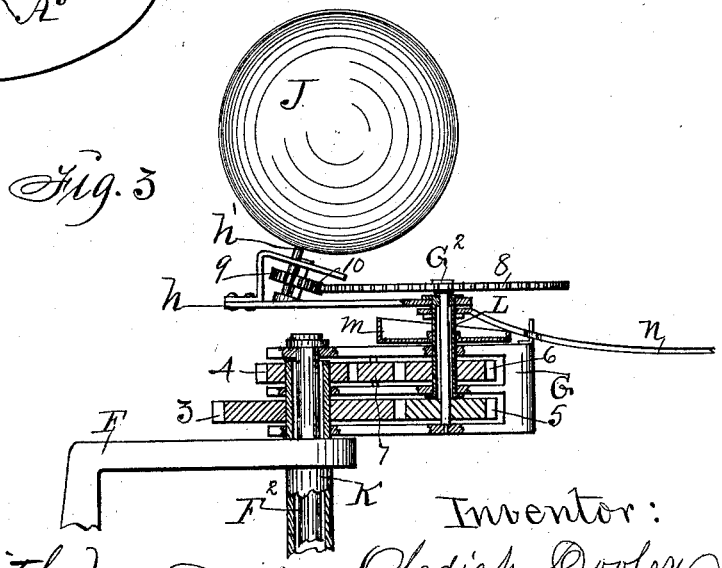


Fig. 3



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(No Model.) 2 Sheets—Sheet 2.

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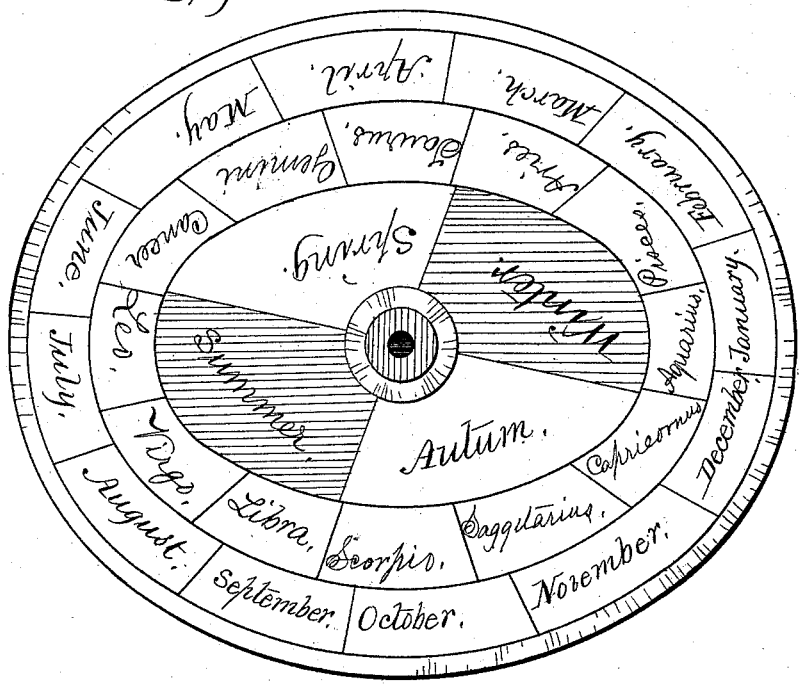
Fig. 4



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UNITED STATES PATENT OFFICE.

OBADIAH DOOLEY, OF WAHOO, NEBRASKA.

TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 423,036, dated March 11, 1890.

Application filed July 9, 1889. Serial No. 316,905. (No model.)

To all whom it may concern:

Be it known that I, OBADIAH DOOLEY, a citizen of the United States of America, and a resident of Wahoo, in the county of Saunders and State of Nebraska, have invented an Improved Tellurian, of which the following is a specification.

My invention consists in the construction and combination of operative mechanism and a portable base, as hereinafter set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side view, and Fig. 2 a top view, of my complete invention. Fig. 3 is an enlarged detail view of the mechanism that simultaneously moves the earth and the moon in their distinct orbits. Fig. 4 is an enlarged top view of the base upon which the four seasons or sun's solstices, the signs of the zodiac, and the months are indexed as the mechanism is operated.

A is the base upon which the operative mechanism is mounted. It is flat and elliptic in shape, as required, to conform with the orbit of the earth. It is preferably made of solid metal, and may vary in size and weight as desired. Upon its center are outlined the zones or areas representing spring, summer, autumn, and winter. Around the space occupied by the signs of the seasons are the twelve zodiacal signs, and around them the twelve months of the year are represented by areas of different sizes, as required to indicate different numbers of days and different length of days occasioned by the varying relative positions of the earth and the sun as they revolve during the year.

A^2 is a post fixed to the center of the base.

B is an arm pivoted to the post A^2.

B^2 is a crown-wheel, and B^3 a gear-wheel fixed to the post in such a manner that the arm can be revolved around the wheels and post that remain stationary on the base A.

C is a U-shaped bracket or lamp-bearer fixed to the socket or pivoted end of the arm B.

C^2 is a lamp attached to a staff C^3, that rotates horizontally in the step and bearing provided therefor on the free end of the bracket.

d is a pinion fixed to the staff to engage the gear-wheel B^3 in such a manner that the lamp (representing the sun) will be rotated on its axis whenever the arm B and bracket C are revolved around the post A^2.

d' is a rotating shaft extended through bearings in the end of the straight portion of the arm B.

d'' is a pinion fixed to the inner end of the shaft to engage the crown-wheel B^2 in such a manner that the shaft will be rotated when the arm is revolved.

F is a frame formed on or fixed to the free end of the arm to support the earth and moon and mechanism to move them simultaneously in their respective orbits.

F^2 is a rotating shaft supported in a vertical position in the frame F, and connected with the horizontal shaft *d'* by means of bevel gear-wheels Nos. 1 and 2, as clearly shown in Fig. 1.

G is a frame fixed to the top of the shaft F^2, to be revolved horizontally thereby twelve times while the arm B makes one revolution.

G^2 is a rotating shaft in a vertical position and in bearings near the free end of the frame G.

h is an arm fixed to the top of a tube that incloses the shaft G^2 to extend horizontally.

h' is a rotating staff in bearings formed in and fixed to the end of the arm *h* in such a manner that the shaft will extend vertically in an inclined position to serve as the axis of the earth J, supported thereby and fixed thereto to rotate therewith.

K is a tube fixed to the frame F in concentric position with the shaft F^2. It extends down to the wheel No. 2 and upward through the frame G.

Nos. 3 and 4 are gear-wheels fixed to the tube.

No. 5 is a gear-wheel fixed to the shaft G^2, to engage the fixed wheel No. 3.

L is a rotating tube fixed to the frame G in concentric position with the shaft G^2 to extend down to the wheel No. 5 and up to the top portion of the shaft G^2, as shown in Fig. 3.

No. 6 is a gear-wheel fixed to the tube L, and No. 7 is an idler located between the wheel No. 6 and the wheel No. 4, to transmit motion from wheel No. 4, as required to rotate the tube L and arm *h* in a reverse direction from the motion of the shaft G^2.

No. 8 is a gear-wheel fixed to the top of the shaft G^2.

No. 9 is a pinion fixed to the staff *h'*, and No. 10 is an idler located between the wheel No. 8 and the pinion No. 9, to transmit mo-

tion from the wheel No. 8 to the pinion No. 9, as required to rotate the shaft G^2 and the staff h' simultaneously in reverse ways and at different rates of speed. The same result will be attained by placing the idler between the wheels Nos. 3 and 5.

m is a disk fixed to the tube L. It has a vertically-extending flange at its circumference, and the top edge of the flange is an inclined plane.

n is a curved arm pivoted to the tube L, above the disk m, in such a manner that it will rest upon the inclined plane of the flange to be raised and lowered as the disk is revolved.

P represents the moon fixed to the free end of the arm n.

r is a pin fixed to the frame G, to extend up through an elongated perforation in the arm n, to impart motion to the arm, as required to revolve the arm horizontally, and to allow it to ascend and descend while in motion, so that the moon will rise and fall relative to the plane of the earth's orbit.

In the practical use of my invention I place the base upon a level surface and then revolve the arm B upon its pivot. Each complete revolution of the arm denotes one year of time, and will cause all the operative elements and subcombinations of the machine to coact in making and showing every movement and position of the earth J and the moon P relative to the sun C, that at the same time revolves upon its own axis; and during the unitary actions of the different parts during each revolution of the arm B around its center of motion the following astronomical demonstrations will be made and plainly visible, to wit: first, the daily and annual revolutions of the earth; second, the revolutions of the earth and moon around their common center while making their annual revolution around the sun; third, the moon rotating around the earth, keeping the same side toward the earth, and at the same time revolving on its own axis; fourth, the rise and fall of the moon ten degrees, five above and five below the plane of the earth's orbit; fifth, all phases of the moon; sixth, the earth's inclination and right positions of its axis at all times; seventh, the aphelion and perihelion of the earth; eighth, the apogee and perigee of the moon; ninth, the conjunction of the earth, moon, and sun; tenth, the eclipses of the moon and sun; eleventh, the equinoxes, longitude, latitude, and climatic zones; twelfth, the changes of seasons and variations in the length of days and nights; thirteenth, the simultaneous movements of the sun around its center and on its axis.

The stationary wheel B^2 has seventy-two teeth. d'' has twelve teeth and revolves six times on its own axis while the arm B passes around B^2 once. Wheel No. 1 has forty-eight teeth and makes the same number of revolutions as d''. No. 2 has twenty-four teeth and makes twelve revolutions while d'' makes six. No. 3 has ninety-six teeth and is stationary with reference to the wheels that engage it. No. 4 has twenty-six teeth. No. 5 has twenty-four teeth and makes sixty-one revolutions while the arm makes one. To verify this I take into consideration the fact that any wheel rotating around another wheel that is stationary gains one revolution on its own axis. With these wheels No. 5 is carried around No. 3 twelve times, and while passing around one time No. 5 makes four revolutions with reference to No. 3; but with reference to any point outside of No. 3 No. 5 makes five revolutions. Then while passing around No. 3 twelve times No. 5 will gain twelve revolutions. No. 3 having ninety-six teeth and No. 5 having twenty-four teeth will cause No. 5 to revolve $12\times4=48+12=60$ revolutions with reference to space. Wheel No. 6 has twenty-four teeth, and the idler No. 7 may have any number desired. Wheel No. 8 has sixty teeth, and, being on the same shaft with No. 5, will make sixty revolutions; but wheel No. 8 gains one revolution upon the earth J. This is caused by the earth having to remain in one position while the wheel No. 8 has to move around it. This extra revolution of No. 8 makes its number of revolutions with reference to the earth sixty-one. Wheels Nos. 9 and 10 have each ten teeth and make three hundred and sixty-six revolutions each. Wheel B^3 has one hundred and seventy-six teeth and is stationary. Wheel d has twelve teeth and makes fourteen and two-thirds revolutions while passing around B^3 once.

I claim as my invention—

1. The shaft F^2, having a frame G fixed to its top, the tube K, having fixed wheels Nos. 3 and 4, the shaft G^2, having fixed wheels Nos. 5 and 8, the tube L, having a fixed arm h, the staff h', supporting the earth J and connected with the wheel No. 8 by means of wheels Nos. 9 and 10, arranged and combined with the frame F, arm B, and shaft d', to operate in the manner set forth, for the purposes stated.

2. An improved tellurian comprising the following elements, to wit: a base of elliptic shape having the seasons, zodiacal signs, and months delineated on its top surface; a post fixed to the center of the base, having a crown-wheel and a gear-wheel fixed to its top portion; an arm having a bracket or extension adapted to support a lamp; a rotating lamp-stem having a fixed pinion to engage the gear-wheel on the post; a rotating shaft extending parallel with the arm and provided with a pinion to engage the crown-wheel on the post; a frame on the free end of the arm; a shaft extending vertically in said frame and connected with the horizontal shaft carried by the arm by means of bevel-gear; a frame projecting horizontally from the top of the vertical shaft; a tube in concentric position with the vertical shaft; two gear-wheels fixed to the tube; a minor vertical shaft carried by the frame, fixed to the main vertical shaft, and provided with fixed gear-wheels at its top and

bottom; a tube in concentric position with the minor vertical shaft and provided with a fixed gear-wheel and a fixed disk or circular inclined plane; a staff supporting the earth and connected with the minor vertical shaft by suitable gearing, and a stem supporting the moon, pivoted to the minor vertical shaft, arranged and combined substantially as shown and described, to operate in the manner set forth, for the purposes stated.

OBADIAH DOOLEY.

Witnesses:
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GEO. F. FRUSH.