(No Model.)

C. A. BOWSHER.

TELLURIAN.

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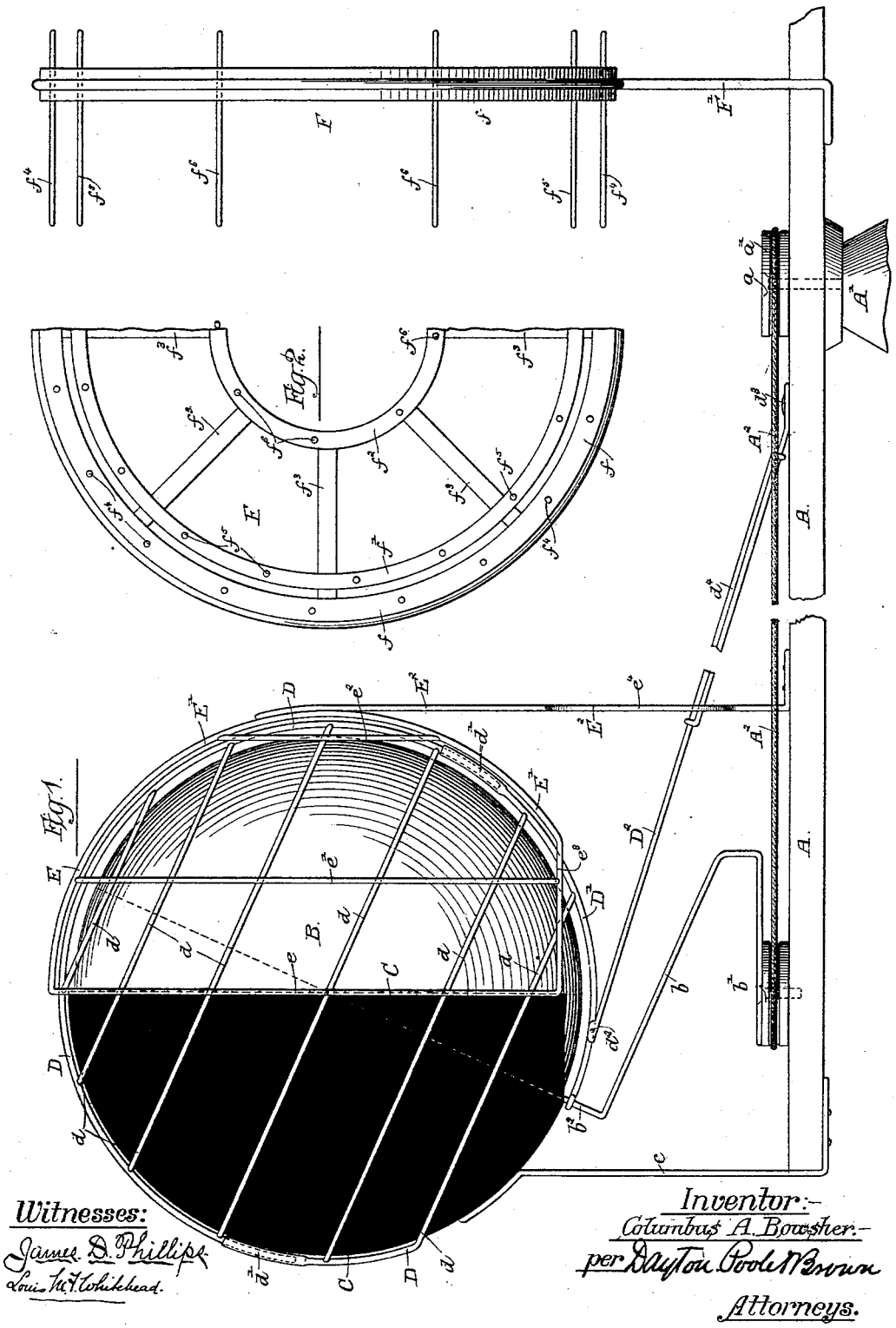

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UNITED STATES PATENT OFFICE.

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TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 457,487, dated August 11, 1891.

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To all whom it may concern:

Be it known that I, COLUMBUS AUSTIN BOWSHER, of Champaign, in the county of Champaign and State of Illinois, have invented certain new and useful Improvements in Tellurians; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention has for its object to provide an apparatus in the nature of a tellurian, for the better illustration of the effect upon the earth of the sun's rays in producing night and day and heat and cold, in the revolution of the earth about the sun, and in its diurnal rotation on its own axis.

The nature of the invention will be fully understood from the following description of the accompanying drawings, in which—

Figure 1 is a side elevation of the apparatus, and Fig. 2 is a fragmentary end view of a portion thereof.

Describing the invention as illustrated in the drawings, A represents a horizontal bar pivoted upon a suitable standard A′ by means of a vertical non-rotating pivot a, upon the upper end of which, and above the bar A, is fixed a non-rotating pulley a'.

B is a globe, representing the earth, supported above one end of the bar A by means of a bent wire b secured to a pulley b', which is mounted rotatably on the upper side of the bar A in the same plane with the pulley a'. The vertical axis of the pulley b' is in line with the center of the globe B, and the upper portion b^2 of the wire b, to which the globe is applied, is directed through the center of the globe and stands at an inclination of twenty-three and one-half degrees to the vertical.

C is a hemispherical hood covering that half of the globe B which is beyond or exterior to the vertical line of the axis of the pulley b', measuring from the axis of the pulley a', such hood indicating the unilluminated surface of the globe. It is supported from the bar A by means of the standard c, and its lower portion is cut off in a horizontal plane, as shown, to allow revolution of the standard b about the axis of the pulley b'.

D is a spherical cage, external to the globe B and its hemispherical hood C, said cage being composed of the circular wire or band D′, loosely attached to the axial portion b^2 of the standard b and the series of circular bands or wires d d, arranged parallel with each other and in planes at right angles to the axial portion b^2 of said standard b, which axial portion b^2 represents the axis of the earth or globe B. The wires d d represent parallels of latitude. The member D′ of this cage is divided at d' d', one part being provided with socket-pieces to admit the ends of the other part for the purpose of allowing the cage to be placed around the globe and its hood.

D^2 is a longitudinally-extensible arm connecting the wire D′ with the beam A for the purpose of preventing the cage D from revolution with the standard b supporting said cage, and to this end said arm D^2 has a vertical hinge at d^2, where it connects with the member D′ of said cage, a vertical pivot d^3 uniting its opposite end with the bar A near the pulley a' and a slip-joint d^4 between its ends. Any slight vertical movement taking place in the free end of the arm D^2 when the cage D is shifted or oscillated by the turning of the standard b is afforded by the flexure of said arm.

E is a second and hemispherical cage external to the cage D, and supported from the bar A by the standard E^2, which is bent laterally at e^4 to afford space for the movement of the arm D^2. Said cage E is composed of a circularly-bent wire e, located in a plane passing through the center of the globe, a smaller circularly-bent wire e', and a third and still smaller circularly-bent wire e^2, severally attached in parallel planes to the circularly-bent wire E′, which serves as their immediate support. This cage E forms a skeleton hemispherical covering for that portion of the globe not covered by the hood C, and like the hood, is truncated at its lower part to allow the revolution of the axial globe-support b^2. For this purpose the supporting member E′ of the frame has branches e^3, one on either side, to which the ends of the incomplete circles e e' are secured in any suitable manner.

F is an annular frame composed, as here shown, of the three concentric rings f f' f^2, connected by radial bars f^3, and supported from the beam A by means of a standard F′. The annular frame F stands in a plane transverse to the beam A, and its axis is in line

with the center of the globe B. In the rings $f f' f^2$, respectively, are set wires $f^4 f^5 f^6$, parallel with the axis of said rings, said wires representing three different and concentric cylinders of sun's rays. The innermost cylinder (indicated by the wires f^6) represents the sun's rays, which, prolonged to contact with the surface of the globe B, circumscribe the area of torrid effect. The intermediate cylinder of rays f^5 circumscribes the limit of the sun's rays of temperate effect, and the outer cylinder of rays f^4 represents those of the sun's rays which are nearly tangent to the surface of the globe, and which therefore have little heating effect. The several wires e, e', and e^2 of the cage E are in line with the several cylinders of rays f^4, f^5, and f^6, respectively, and therefore represent the lines of contact of said cylinders of rays with the globe's surface. It will thus be seen, by the above arrangement of projections representing cylinders of the sun's rays, that in the movement of the globe upon its axis and in its revolution both the permanent effect of the angle of contact of the sun's rays upon the various parts of the earth according to their distance from the torrid belt will be shown, and also their effect upon the temperature at different hours of the day.

To operate the apparatus described, a belt A^2 is trained over the pulleys a' and b', and the bar A is revolved on its pivot a. In this movement of the bar A the pulley b' is revolved once on its axis and causes a single revolution of the globe B about the vertical axis of rotation of the pulley b' and standard b at each revolution of the bar A. The bodily motion of the globe B once around the axis a gives to said globe what answers to the annual revolution of the earth about the sun, and the revolution of the standard b, having the inclined axial part b^2, preserves the inclination of the earth's axis to the plane of its orbit in making such annual revolution. The hood C is retained permanently in its position by the standard c, the cage E is similarly held stationary by its support E^2, and the inner cage D is held with the same side and with its wire D' (answering to the noon meridian) toward the frame F by means of the extensible arm D^2, which, however, permits to said cage the rocking motion due to its connection with the inclined portion b^2 of the standard b. In any position of the globe B in its revolution about the axis a, on which the beam A swings, a rotary movement may be given to the globe upon its axis b^3, either by hand or otherwise, to represent the diurnal rotation of the earth on its said axis. The parallels d d automatically afford a measurement of the relative lengths of the days and nights at the season of the year determined by the inclination of the axis of the globe to the plane in which it revolves on any point on the earth's surface of corresponding latitude, the night being represented by the hood C and the day by the cage E. The cage E may obviously be provided with any number of parallel wires or bands e e', and the frame F with a corresponding number of rings bearing wires representing cylinders of sun's rays.

By the apparatus described illustration of light and shadow or day and night, and of heat effects in different portions of the twenty-four hours and on different parts of the globe, and the relative length of days and nights when the earth is in different parts of its orbit, may be easily explained to and understood by pupils not advanced in the study of astronomy.

I claim as my invention—

1. The combination, with a globe mounted upon a swinging arm and upon its own axis, whereby motion may be given thereto corresponding to the annual and diurnal movements of the earth with respect to the sun, a series of concentric rings carrying wires parallel with the axis of said rings and representing cylinders of the sun's rays, and a hemispherical cage covering that portion of the globe adjacent to the concentric rings provided with annular members in line with the wires which represent the cylinders of the sun's rays.

2. The combination, with a globe mounted upon a swinging arm and upon its own axis, whereby motion may be given thereto corresponding to the annual and diurnal movements of the earth with respect to the sun, of a hemispherical hood arranged to cover half the globe, and representing the unilluminated portion of the globe, a cage surrounding said globe and hood and having members which represent parallels of latitude, a series of concentric rings mounted upon said swinging arm carrying wires parallel with the axis of said rings and representing cylinders of the sun's rays, and a hemispherical cage covering that portion of the globe and cage adjacent to the concentric rings and provided with annular members in line with the wires which represent the cylinders of the sun's rays.

3. The combination of the swinging bar A, non-rotatable pulley a', rotatable pulley b', a bent standard b, supported by the latter, a globe mounted on an inclined portion of the bent standard, a hood C, covering part of the globe and supported by the bar A, a cage, as D, fitting over the globe and hood and rotatable with respect to the globe on the axis thereof, an extensible arm pivoted to the cage and to the swinging bar A, a hemispherical cage supported by the said bar, and a frame F, having a series of parallel wires to represent cylinders of the sun's rays, and also mounted on the swinging arm.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

C. A. BOWSHER.

Witnesses:

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