

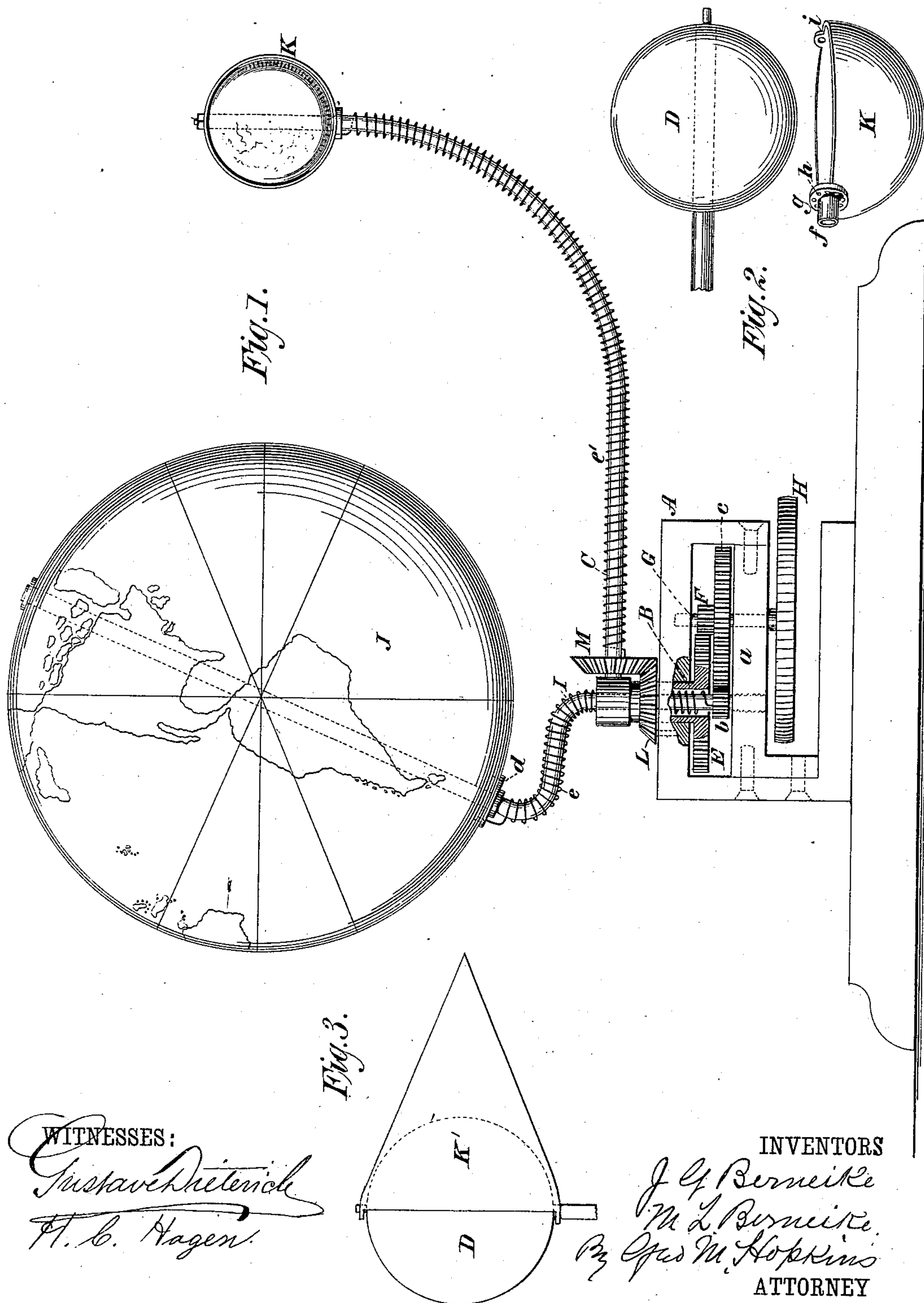
(No Model.)

J. G. & M. L. BERNEIKE.

TELLURIAN.

No. 321,000.

Patented June 30, 1885.



WITNESSES:

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TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 321,000, dated June 30, 1885.

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To all whom it may concern:

Be it known that we, JOHANNES G. BERNEIKE and M. LOUISE BERNEIKE, both of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Tellurians, of which the following is a specification, reference being had to the annexed drawings, forming a part of the same, in which—

Figure 1 is a side elevation partly in section. Fig. 2 is a detailed view of the moon and hemispherical covering, and Fig. 3 shows the moon provided with a conical shell representing the moon's umbra.

The object of our invention is to provide a simple and convenient apparatus for illustrating some of the phenomena resulting from lights and shades or lights and shadows on heavenly bodies—such as the moon, planets, &c.

Our invention consists in the combination, with the sphere representing the moon or a planet, of a hemispherical shell inclosing one-half of the sphere, and made of a dark color to represent the shaded side of the heavenly body, the sphere itself being mapped or colored to represent the surface of the body.

Our invention also consists in the combination, with the sphere or spherical shell, of a flexible spiral surrounding the arm which supports the sphere, and adapted to either hold the sphere or hemispherical shell stationary while the supporting-arm is moved or to rotate the shell or sphere upon the arm.

We shall describe our improvement as applied to a tellurian representing the earth and moon; but it may be applied to any other instruments of this class—such as orreries, planetariums, &c.

In the frame A, of suitable construction, is journaled a sleeve, B, which projects through the top of the frame and carries a curved arm, C, whose outer end is bent upward vertically and supports a sphere, D, representing the moon. Upon the lower end of the sleeve B is secured a spur-wheel, E, which is engaged by a pinion, F, on the shaft G, journaled in the frame A, and provided at its lower end with a milled wheel, H, by which it is turned. In the middle bar, a, of the frame A is secured a curved rod, I, which projects upward through the sleeve B, and carries upon its upper por-

tion a sphere, J, representing the earth. Upon the rod I, above the bar a, is loosely placed a pinion, b, which is engaged by a spur-wheel, c, secured to the shaft G. The sphere J turns freely on the rod I, and is provided with a flange, d, having a circular row of apertures for receiving one end of a spiral spring, e, the other end of which is secured to the pinion b. Surrounding the sphere D is a hemispherical shell, K, provided at the lower side with the sleeve f, carrying a collar, g, in which is formed a series of apertures, h. The sleeve f receives the arm C below the sphere D, and in the diametrically-opposite side of the shell K is formed an eye, i, for receiving a pivot formed upon the extremity of the arm C. The shell K is of a dark color and incloses the sphere D, which is painted to represent the face of the moon. A miter-wheel, L, is engaged by a miter-wheel, M, turning loosely on the arm C, and a spiral spring, e', attached to the miter-wheel M, surrounds the arm C, and is bent outward at its outer extremity so that it may enter one or the other of the holes h in the collar g, carried by the hemispherical shell K. The arm C carries the sphere D, representing the moon in an appropriate orbit around the earth, and the moon, being fixed to the end of the arm D, always presents the same surface toward the earth, the hemispherical shell K being adjusted relative to some source of light—such as a window or a lamp—so as to represent the shaded side of the sphere D. When the arm C is revolved about the earth, the hemispherical shell is made to preserve its position relative to the source of light by virtue of its connection with the miter-wheels L M through the spiral spring e'. The wheels and pinions E F and b c are proportioned to each other so as to produce the proper relative motions of the earth and the moon. By turning the milled wheel H the sphere J, representing the earth, is made to revolve by its connection with the pinion b through the spiral spring e. The same operation revolves the sleeve B slowly, and in carrying the arm C around the sphere J causes the wheel M to roll on the wheel L and make one revolution on its axis while the sleeve B makes one revolution on its axis. The motion of the wheel M is imparted to the shell K through the spring e', as already described, so that while the sphere D, representing the moon, makes

one revolution around the earth the shell K makes one revolution around the said sphere D, causing the shell to always maintain a position opposed to the source of light, while to the observer stationed upon the sphere J, representing the earth, the shell K, which represents the shaded portion of the moon, will move over the moon's surface, so as to exhibit all the phases of the moon. Any adjustment necessary to place the shell K in proper relation to the source of light may be made by removing the end of the spring e' from one of the holes h in the collar g and placing it in another.

In Fig. 3 we have shown a shell, K', of conical form, to represent the moon's umbra. When this shell is employed, it will be kept in proper relation to the source of light by means of the spiral spring e' , as already described in connection with the hemispherical shell K.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a tellurian or similar astronomical instrument, of a sphere representing a heavenly body, a shell inclosing one-

half of the said sphere, an arm for supporting the sphere, and an elastic spiral surrounding the arm and connected with the shell and capable of communicating motion to the shell, as herein specified.

2. The combination, with the sphere D and arm C, for supporting the said sphere, of a hemispherical shell, K, provided with an apertured collar, g , and the elastic spiral e' , as described.

3. The combination of the sleeve B, arm C, and flexible spiral e' , surrounding the said arm, the fixed miter-wheel I, and movable miter-wheel M, as specified.

4. The combination, in a tellurian, of the arm C, sphere D, hemispherical shell K, flexible spiral e' , the sphere J, rod I, and flexible spiral e , and mechanism for imparting motion to the spirals e e' , as herein specified.

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Witnesses:

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