

No. 740,978.

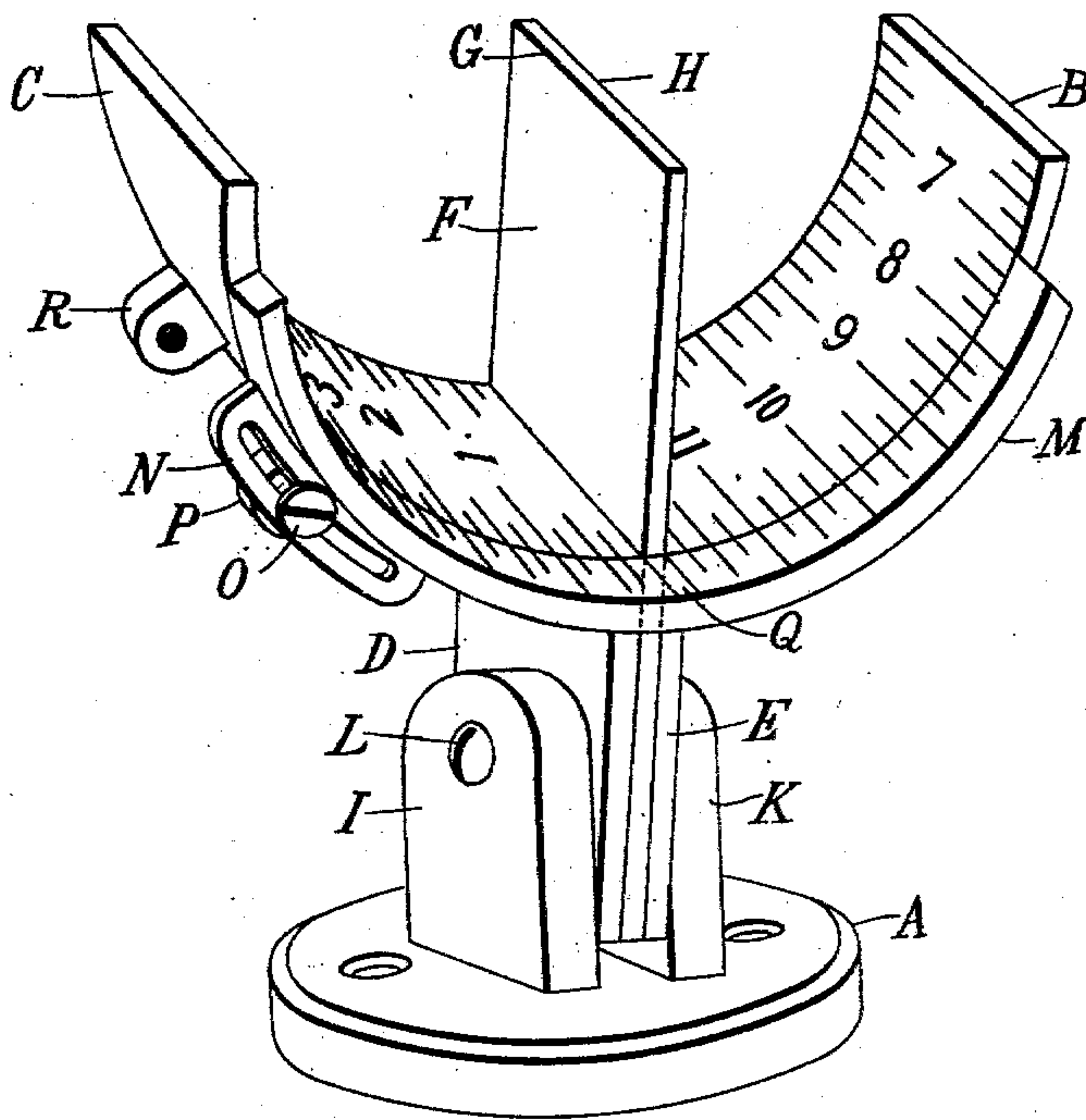
PATENTED OCT. 6, 1903.

E. G. HEWITT.

SUN DIAL.

APPLICATION FILED JUNE 13, 1903.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD G. HEWITT, OF NEW YORK, N. Y.

SUN-DIAL.

SPECIFICATION forming part of Letters Patent No. 740,978, dated October 6, 1903.

Application filed June 13, 1903. Serial No. 161,267. (No model.)

To all whom it may concern:

Be it known that I, EDWARD G. HEWITT, a citizen of the United States, residing at New York, county of Kings, State of New York, have invented certain new and useful Improvements in Sun-Dials, of which the following is a specification, reference being had to the drawing accompanying and forming part of the same.

The invention which forms the subject of the present application relates to devices for determining the time of day by the varying position of the shadow of a gnomon or pointer when exposed to the sun in proper relation to the points of the compass and the latitude of the place. It has for its object to produce a simple and comparatively inexpensive apparatus by which it may be possible to tell the time with a fair degree of accuracy, adjustable to adapt it for use in different latitudes, and having means to correct its readings for equation of time and for distance east and west of a standard meridian. To these ends it consists of the novel features and combinations of parts hereinafter described, and more particularly set forth in the claims.

Referring now to the drawing for a clear understanding of the invention, the figure is a perspective view of a convenient embodiment of the same. It comprises a base A and a "dial" pivotally mounted thereon. The latter is formed of two arc-shaped sections B and C, made integral or suitably secured to the tongue-sections D E, extending radially downward, as shown. Arranged between the sections is a gnomon F, preferably extending the full length of the depending parts D and E, the three being suitably fastened together, so as to constitute the supporting-tongue. The arc-shaped sections are thus separated at their adjacent ends by a distance equal to the thickness of the gnomon. The latter extends upward far enough to make the edges G H coincide with the centers of curvature of their respective sections, forming, as it were, a radius of the arc-shaped dial. If now the apparatus be exposed to the sun with the edges G H of the gnomon parallel to the axis of the earth, the shadow of the edge G in the morning will sweep from the top of the western quadrant C down to

the foot of the gnomon as the sun passes the meridian, and then the shadow of the edge H will travel upward from the base to the top of the eastern quadrant B. The inner surfaces of the arcs are each divided into six equal divisions to mark the hours, and the latter are subdivided as desired to mark fractions of hours.

To adapt the instrument for use in different latitudes, the dial is pivoted to the base, so as to be capable of angular adjustment in the plane passing through the north and south poles. A convenient construction for this purpose is to provide the base A with one or more standards I K, to which the tongue D E is attached by a screw-pivot L. By setting up the latter the instrument may be firmly secured in position when it has been properly adjusted to the latitude of the place where it is to be used.

As is well known, local sun-time and mean solar time agree only at intervals throughout the year, the difference being known as "equation of time." The divergence at times amounts to as much as a quarter of an hour, and as this is a considerable error it is customary to provide a sun-dial with a table giving the minutes to be added to or subtracted from local sun-time on each day or selected days to obtain mean solar time. This plan is troublesome, however, when the instrument is frequently consulted, and some form of direct reading means for making the correction is preferable. I therefore arrange on the edge of the dial a narrow curved slide M by means of slotted ears, as N, coacting with screws, as O, in lugs or projections, as P, on the quadrants. The slide is marked with graduations equal in extent to those on the dial, and, like the latter, is composed of two sections secured together, but separated by a space Q equal to the thickness of the gnomon. By moving the slide east or west, as the case may be, and reading the shadow on the slide graduations the time may read fast or slow of the sun, the difference being of course determined by the position of the slide graduations with reference to those on the dial proper. By tightening the slot-screws the slide may be fastened in adjusted position, in which it may remain for some days before the error becomes so great

as to require another adjustment. By the same device the instrument may be set to give the time of another locality, as "standard" time or the time at a standard meridian 5 east or west of the dial. For example, the difference between sun-time at Washington, District of Columbia, and a place X, whose longitude is $3^{\circ} 45'$ east or west, is a quarter of an hour. So by adjusting the slide east or 10 west one-quarter of the space between hour-marks Washington sun-time may be read. By moving the slide backward or forward from this position the proper distance to correct for equation of time mean solar time at 15 Washington, which is Eastern standard time, will be given.

If desired, a second slide may be provided, carried by another set of lugs, as R, which may be utilized for standard time and the 20 first for mean solar time of the particular locality.

The dial, consisting of the quadrants, the gnomon, and the tongue, is preferably, especially in large sizes, made in parts, to be 25 assembled as described; but it may obviously be formed in one piece, as by casting. Nor is it necessary that the arc-shaped sections be quadrants; but they may be equal to any part of a circle less than ninety degrees. 30 In such case, however, the shadow near sunrise and sunset sometimes will fall outside the arcs. The invention is also capable of other embodiments, and I therefore do not

consider myself limited to that herein specifically described. 35

What I claim is--

1. In a sun-dial, the combination with a pair of arc-shaped sections arranged adjacently about a substantially common center, having tongue-sections extending radially downward 40 from their adjacent ends, and a gnomon extending from the common center to a point between the tongue-sections, of a base, and a standard on the base, to which the assembled tongue-sections are pivoted, whereby the 45 dial may be angularly adjusted in the plane of the gnomon to adapt the instrument for use in different latitudes, as set forth.

2. In a sun-dial, the combination with a pair of graduated arc-shaped sections arranged 50 adjacently about a substantially common center, having tongue-sections extending radially downward from their adjacent ends, and a gnomon extending from the common center to a point between the tongue-sections, of a 55 base, a pivot connection between the assembled tongue-sections and the base, and a graduated arc-shaped slide arranged contiguous to the arc-shaped sections, whereby the readings of the latter may be corrected, as set 60 forth.

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Witnesses:

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