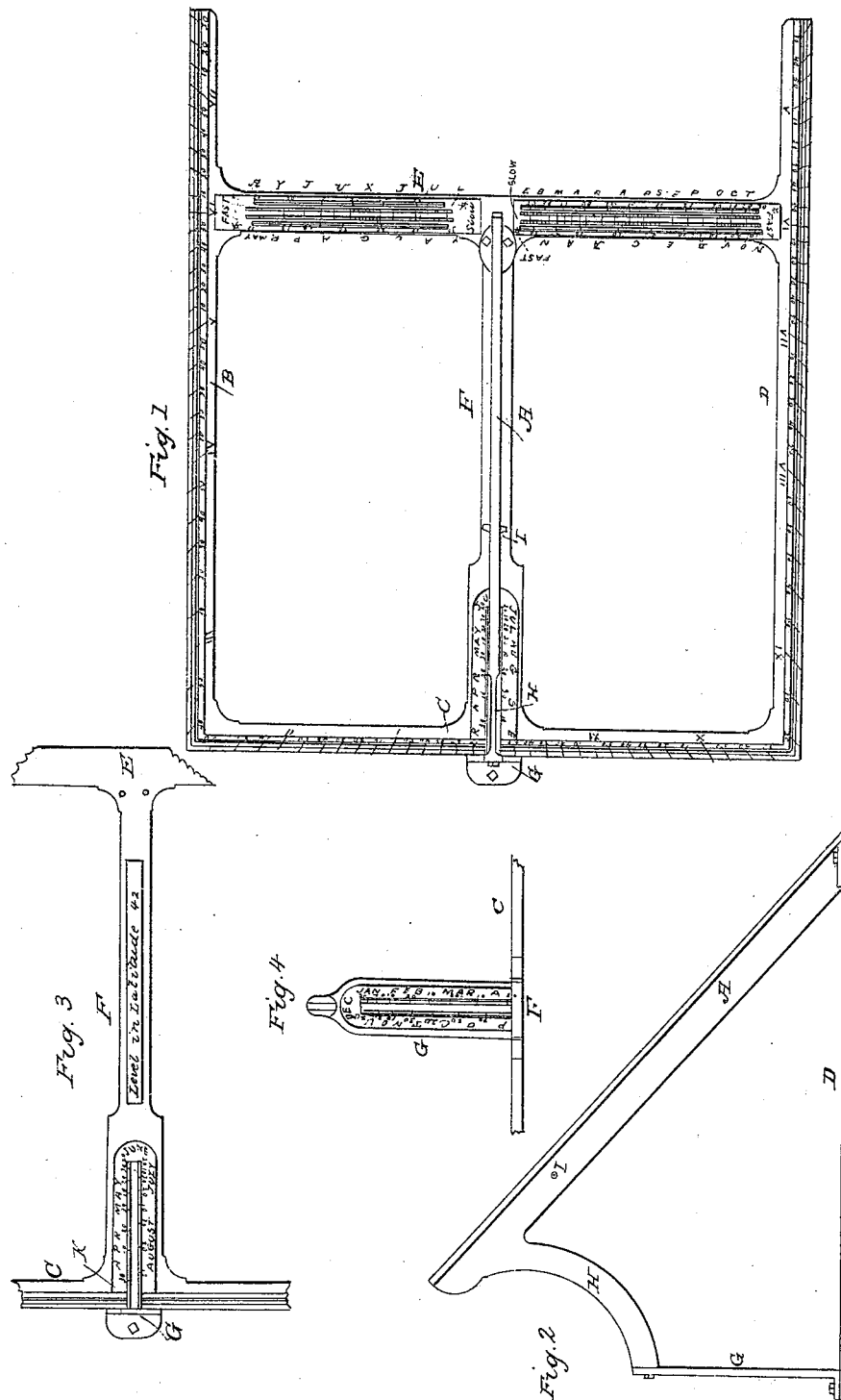


J. SCOTT.

Sun Dial.

No. 6,506.

Patented June 5, 1849.



UNITED STATES PATENT OFFICE.

JAMES SCOTT, OF PORTLAND, MAINE.

SUN-DIAL.

Specification of Letters Patent No. 6,506, dated June 5, 1849.

To all whom it may concern:

Be it known that I, JAMES SCOTT, of Portland, in the county of Cumberland and State of Maine, have invented new and useful Improvements in the Sun-Dial; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of the said drawings Figure 1, denotes a top view of my improved sun dial. Fig. 2 is a side elevation of it. Fig. 3 is a top view of the center bar which is placed underneath the gnomon. Fig. 4 is an inner view of the upright plate, which constitutes part of the support of the upper end of the gnomon and on which a part of the scale of the sun's declination or the day of the month scale is marked as will be hereinafter described.

My invention consists in combining with the gnomon a small pin wire or shadow indicator, and a scale to exhibit by means of the shadow of such a pin or indicator, the month and day of the month; (whereby the dial may not only be made to indicate the time of the day, but also the day of the year, that is to say the month and the day of the month).

A, Figs. 1 and 2 is the gnomon or shadow style, the upper edge of which is raised at such an angle above the plane of the hour bars B, C, D, as will make it when ranged on the meridian or north and south, parallel with the axis of the earth.

The hour bars B, C, D, consist of three long and straight bars connected together and arranged with respect to each other as seen in Fig. 1, the two parallel bars B, D, being united by a cross bar E, which is made parallel with the bar C. The two bars C, E, are connected by the center bar F the whole five bars B, C, D, E and F being connected by being cast or founded in one piece.

A plate or bar G is made to extend upward from the middle part of the outer edge of the bar C, and to be connected to the gnomon by a curved bar or strut H, the two bars G and H serving to support the upper end of the gnomon. The hours and fractional parts of the hours are defined or marked on the bars B, C, D, as represented by the marks I, II, III, IV, &c., and the figures 10, 20, 30, etc., the same being arranged according to the well known principles

of dialing, except that each division is carried an angle of sixteen minutes of a degree (or such an angle as will represent the mean semidiameter of the sun during the earth's revolution on its orbit) nearer to the gnomon, than such division would be placed if it represented the edge of a shadow as produced by a ray of light proceeding from the sun's center. Thus when the outer edge of the shadow of the gnomon strikes the hour bars, the division on which it strikes is made to denote the time of day by the dial. This however requires to be corrected if we desire to find the clock time, the amount of correction being found in the table or scale of the equation of time.

A pin or wire I is passed through the gnomon and made to extend a short distance out from each side of it. The pin is placed in a straight line extended from the sun when on the meridian and at either of the equinoxes, and the vertex of the angle made by the upper plane of the middle bar F, and the inner plane of the upright bar G. The sun's declination during the six winter months is marked on the inner face of the bar G while its declination, during the six summer months is noted on the horizontal bar F all as seen in the drawings, the divisional marks denoting such declination when the sun is on the meridian, and they are respectively on the shadows cast by the pin I, on different days throughout the year when the sun is on the meridian. By marking the proper divisions with the names of the months, and the figures corresponding to the days thereof as seen in the drawings, we are enabled at any time when the sun is on the meridian, or about on it, to determine the month as well as the day thereof.

The scale of the equation of time is made upon the top surface of the bar E, or each half thereof as seen in Fig. 1. On the left hand portion of the scale it begins near the zero point in the middle, with the first day of September and contains a series of months continued quite around such part of the scale, to the fifteenth day of April near the same point, where it will be well to place some peculiar separation mark, because the regular series of months is there interrupted. The other or right hand portion of the scale, may be said to begin at the division denoting the fifteenth day of April. From thence it continues around to the division which denotes the thirty-first

day of August, where some distinguishing mark of separation may be imprinted or made on the scale if desirable. On those months and days which occur between the zero point of each portion of the scale, and the inner end thereof next the gnomon, and where the mark * Slow (sun slow) is made, the sun is slow of the clock, and the clock to be right must be set faster than the time indicated by the shadow of the gnomon on the hour scale, that is to say it must be set faster by the number of minutes and quarter minutes that stand opposite the day of the month. But on those dates which occur toward the outer ends of the two portions of the scale where is the mark * Fast (sun fast) the sun is fast of the clock, and the latter must accordingly be set slower than the former by the number of minutes indicated by the figures against the division which denotes the day of the month answering to the time of observation.

I would here remark that the mere application to the dial of a scale to indicate the equation of time, constitutes no invention which I am aware can be patented by Letters Patent.

So I intend generally to make my improved dials of cast metal, and to cast or found the figures, marks and letters of the same in bas relief, there may not be sometimes or in some parts of the dial space of sufficient width to represent each of the divisions by a straight mark, of such a width as may be desirable for casting the same in the mold. Where such is the case the divisions may be represented by angular notches and projections, or by such other device or devices as fancy and convenience may dictate, the divisions being denoted by the vertices of such notches or projections.

In selecting a site for the dial one should be chosen if possible, where the sun may

shine on it, at all times when above the horizon except when obstructed by clouds. If the dial is elevated one or two feet above the ground, it will be easy to clear it from snow in winter. It may be placed either on a stone step or a frame of plank supported by posts of stone, cedar, or other proper material.

If the latitude of the place is the same as that marked on the dial, the plane of the hour bars should be placed horizontal; and in all cases the gnomon must be arranged with its plane in the meridian, its elevated end being toward the north pole, and the upper surface of it, made parallel with the axis of the earth. If the place be north or south of the latitude marked on the dial, the north side must be elevated or depressed according to the angle of difference that is if the latitude be greater the north side must be elevated, if less it must be depressed, the same being so as to bring the shadow casting edge of the gnomon parallel to the axis of the earth, when the dial is level in an east and west direction.

I am aware that it is not uncommon to place on a dial plate a scale of the sun's declination. I therefore lay no claim to such, but

That which I do claim as my invention is—

The shadow indicator or pin I, and declination scale or scale of months and days, in combination with the gnomon, substantially in the manner and for the purpose as specified.

In testimony whereof I have hereto set my signature this eighth day of Jany. A. D. 1849.

JAMES SCOTT.

Witnesses:

CALEB EDDY,
F. GOULD.