

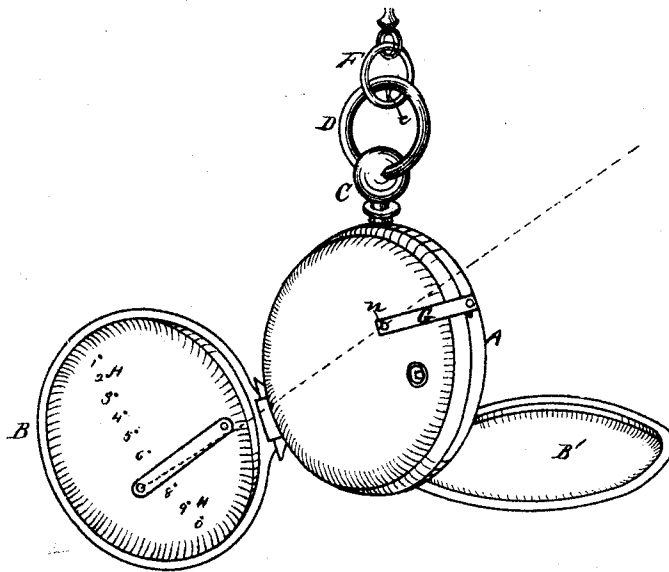
L. MILLER.

Combined Watches and Sun-Dials.

No. 149,142.

Patented March 31, 1874.

Fig. 1.



Witnesses.
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UNITED STATES PATENT OFFICE.

LAWRENCE MILLER, OF PIONEER, MONTANA TERRITORY.

IMPROVEMENT IN COMBINED WATCHES AND SUN-DIALS.

Specification forming part of Letters Patent No. **149,142**, dated March 31, 1874; application filed March 24, 1873.

To all whom it may concern:

Be it known that I, LAWRENCE MILLER, of Pioneer, Deer Lodge county, Territory of Montana, have invented a Watch and Sun-Dial Combined; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

The object of my invention is to combine a sun-dial with an ordinary watch, in such a manner that I am enabled at any time to obtain the solar meridian, and by the use of any calendar with a table of the sun's variation, I am enabled to obtain the correct time. To do this, I suspend the watch delicately by its stem or ring, so that a ray of sunlight will pass through a hole in a standard secured to the rim of the watch and fall upon a graduated scale upon the inside of the case. This may be done at any hour in the morning, and the point being noted, the watch is again suspended in the afternoon, and when the ray of sunlight falls upon the same point the time is taken. The hour midway between the two observations will be the solar meridian, and by the calendar of that day the correct meridian can be ascertained. From this the watch can be regulated.

Referring to the accompanying drawings; A is the annular frame of a watch, having the cases B B' hinged to it, as shown. The ordinary stem C and ring D are secured to one side of the annular frame. At the top of the ring and extending toward the center from the inside is a small pin, *e*. A secondary ring, F, passes through the ring D, and has a small socket-hole, *i*, on the inside, into which the pin *e* is received, and by these rings the whole device is delicately suspended. A standard, G, (which may be of spring steel,) is pivoted to the side of the frame opposite to the hinge of the case, and, when not in use, this standard can be turned down and curved around so as to lie closely against the side of the frame. A suitable lug stops the standard in a position ver-

tical to the frame and parallel to the opened case or cover B. A small hole, *n*, is made through the standard, and when the device is suspended with the case fronting the sun, the light passes through the hole *n* in the standard and falls upon the inside of the case. The case is graduated, as shown at H, and may have a pointer or marker.

In order to take an observation, the watch is suspended as described, and a ray of sunlight is allowed to pass through the hole *n* and fall upon the scale at some hour, as nine o'clock in the morning, and the point is marked. When the sun stands at the same angle in the afternoon and the light falls upon the same mark, the time is again noted. Divide the time, and that will give the hour when the sun is at its meridian. From this it will be easy to know the true time whenever needed by means of any calendar, and if the time of the watch does not correspond it can be regulated.

By this means I provide a sun-dial attachment for a watch, which will be very convenient for obtaining the true solar time, by which the watch can be regulated, and which will be especially valuable to persons who are traveling and without proper means to otherwise obtain the correct time.

The suspension of the watch is so delicate as to insure accuracy in the two observations, so that there will be no mistake.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The standard G, having the perforations *n* at its extremity, in combination with a watch having the case B graduated, as shown, and arranged to be suspended by the rings D and F by means of the pin and socket, substantially as and for the purpose described.

In witness whereof I hereunto set my hand and seal.

LAWRENCE MILLER. [L. S.]

Witnesses:

O. DILLON B. WHITFORD,
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