

2 Sheets—Sheet 1.

No. 364,802.

Patented June 14, 1887.

Fig: 1.

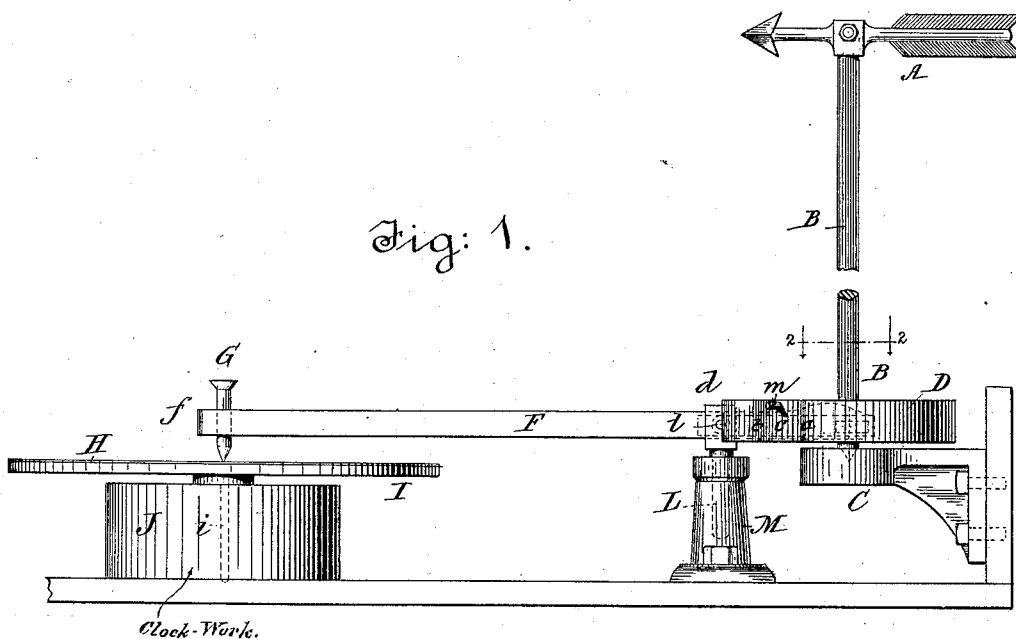
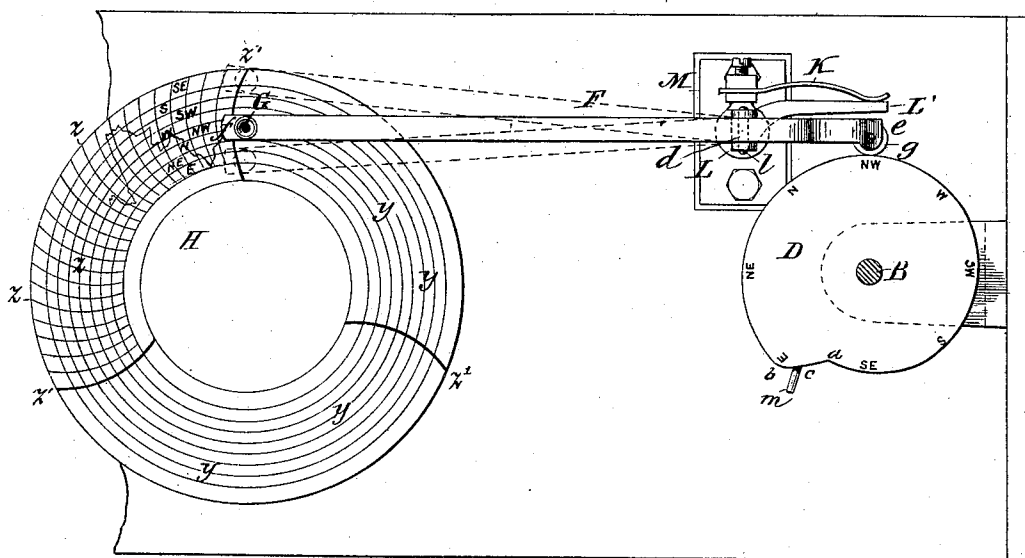


Fig: 2.



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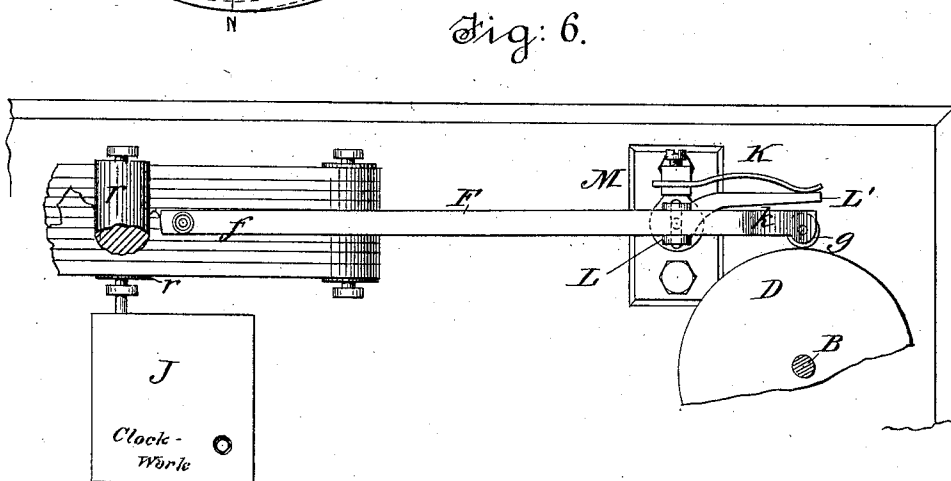
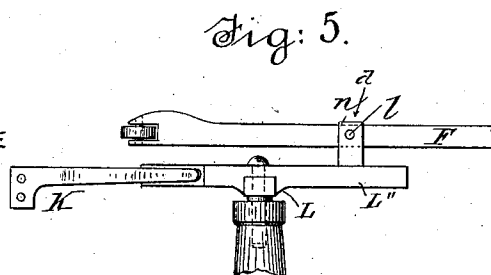
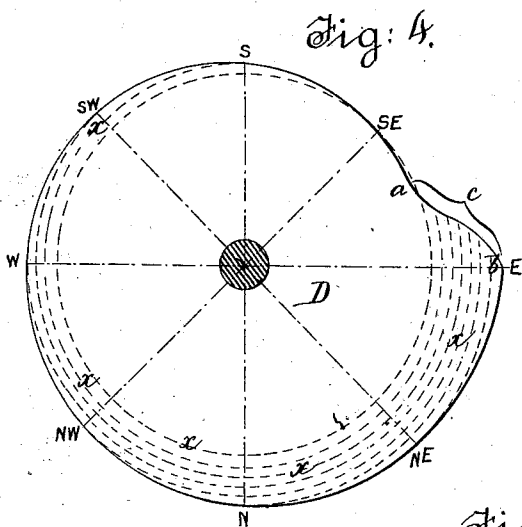
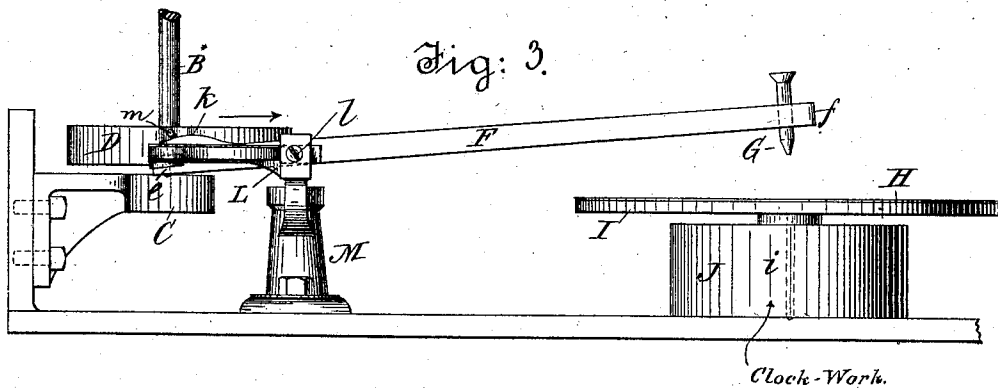
(No Model.)

2 Sheets—Sheet 2.

W. H. CHILDS.  
RECORDING ANEMOSCOPE.

No. 364,802.

Patented June 14, 1887.



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# UNITED STATES PATENT OFFICE.

WALTER H. CHILDS, OF BRATTLEBOROUGH, VERMONT.

## RECORDING-ANEMOSCOPE.

SPECIFICATION forming part of Letters Patent No. 364,802, dated June 14, 1887.

Application filed December 29, 1886. Serial No. 222,862. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER H. CHILDS, a citizen of the United States, residing at Brattleborough, in the county of Windham and State of Vermont, have invented certain new and useful Improvements in Recording-Anemoscopes, of which the following is a specification.

This invention relates to instruments for recording the varying directions of the wind at different times. An instrument for this purpose which is accurate and reliable in its operation, and which may be easily read, is a desideratum with meteorologists.

The object of my invention is to produce an anemoscope of simple and cheap construction which shall fulfill these essential conditions.

The preferred form of my improved anemoscope is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of the instrument. Fig. 2 is a plan thereof in section on the line 2 2 in Fig. 1. Fig. 3 is a fragmentary side elevation looking in the opposite direction from Fig. 1, and showing the parts in a different position. Fig. 4 is a plan of the cam-disk on a larger scale, and Fig. 5 is a fragmentary elevation answering to Fig. 3, and illustrating a slightly-modified construction. Fig. 6 is a plan answering to Fig. 2, and illustrating a modified construction of the recording-paper, the latter being in the form of a strip instead of a disk.

I will first describe the construction shown in Figs. 1 to 4.

A designates the wind-vane, which is of any desired or suitable shape and size, and is fixed upon a vertical rotary shaft, B, which is mounted in suitable bearings and extends down through the roof of the building. (Not shown in the drawings.) I have shown the lower end of this shaft as stepped in a bracket, C; but any other construction providing a suitable bearing may be adopted. On the shaft B, near its lower end, is fixed a cam-disk, D. The shape of this disk is best shown in Fig. 4. Its periphery has the form of a progressive spiral extending from the point *a* around nearly the entire circumference to the point *b*, which is the point of greatest projection. From the point *b* the spiral is departed from and the peripheral surface is somewhat abruptly con-

tracted to *a*, forming what I will refer to as an inclined plane, *c*. The point *b*, of greatest projection, answers to some one point of the compass—as, for instance, east, as denoted by the letter E in the drawings. The diametrically-opposite side of the cam will then correspond to west, and the other points of the compass will answer to the respective positions indicated by the letters NE, N, NW, &c., in Fig. 4. Thus in traversing the spiral surface of the cam, beginning at *b*, one passes successively the positions thereon corresponding to the points of the compass E, NE, N, NW, W, SW, S, and SE, each point being successively nearer the center of the cam, as denoted by the dotted circles *x x*. After passing SE, the point *a*, of shortest radius, is reached. The spiral portion of the cam from *b* around to *a* is the essential part thereof, by means of which the recording is effected, the inclined plane *c* being an interruption of this essential portion. The inclined plane *c* is not instrumental in effecting the recording. Thus the different successive points of the compass are represented on the cam by means of successively shorter radial distances from the center of rotation of the cam to the successive corresponding positions on the spiral periphery thereof.

The cam D acts upon a vibrating lever, F, which is fulcrumed at *d*, and one end, *e*, of which bears upon the periphery of the cam, while the other end, *f*, carries a marking device, G.

H is the paper or other surface on which the recording is done. It is fastened to a table, I, which is mounted on a rotative axis, *i*, Fig. 1, and is rotated by means of clock-work in a box, J. The recording-paper H is marked with concentric circular lines *y y*, which indicate the respective points of the compass, and with radial curved lines *z z*, which indicate divisions of time, and which correspond in position to the rate of speed at which the table I is rotated by the clock-work.

In Fig. 2 I have shown the paper H as being divided by lines *z' z'* into three divisions, representing days. Each of these should be subdivided by the lines *z z* into twenty-four parts of equal width to indicate the hours of the day. For the sake of clearness, only one of the divisions is thus subdivided in Fig. 2. The radial lines *z z z' z'* have the curve of the arc of a circle described by the marking-point

G from the center  $d$ , on which the lever F is fulcrumed.

The lever F is pressed by a spring, K, so that its end  $e$  is held in contact with the periphery of the cam D. To reduce friction, it is preferable to provide the end  $e$  of the lever with an anti-friction roller,  $g$ . The end  $e$  of the lever F being thus pressed against the cam, and the table I, with its graduated recording-paper H, being placed in the proper position relatively to the end  $f$  of the lever, the marking-point G will coincide with the line  $y$  on the paper which corresponds to the position of the wind-vane A. Thus, for instance, if the wind is blowing from the northwest, the cam D, occupying the same position as the vane, presents its side marked NW to the roller  $g$ , and consequently displaces the lever F to such extent that the marking-point G stands directly over the line  $y$  on the paper, which is graduated to indicate that the wind is blowing from the northwest, as shown in Fig. 2. If the wind veers around, for instance, to the south, the movement of the vane turns the cam D until its point marked S is presented against the roller  $g$ , and the lever F is moved by the spring K until its marking-point G stands over the line  $y$ , marked S; or, if the wind veers in the opposite direction, the opposite rotation of the cam will press out the end  $e$  of the lever and move the marking-point G toward the center of the recording-paper H. These movements in either direction will record on the paper H the direction of the wind until, in moving either one direction or the other, either of the extreme points,  $a$  or  $b$ , is presented to the roller  $g$ . If the movement extends past either of these points, a movement of the roller  $g$  and lever F takes place in the opposite direction to that at which it was previously moving, while the cam D continues to revolve in the same direction. Consequently, while the inclined plane  $c$  is passing the roller  $g$ , the lever F vibrates from one extreme position to the other, and its marking-point G sweeps entirely across the concentric lines of graduation on the paper. If the marking-point were permitted to mark the paper during this movement, the indication on the paper which would be thus recorded would denote that the vane A had executed nearly an entire revolution in the opposite direction to that at which it actually did revolve, thus sweeping over nearly all the points of the compass. In order to avoid this false indication, I have devised a means for lifting the marking-point from the paper during the time that the inclined plane  $c$  is in contact with the roller  $g$ . To this end the lever F is pivoted in such manner that it may be vibrated vertically, in addition to its horizontal vibration, and a cam is provided in order to vibrate it vertically at the proper time. This construction is best shown in Figs. 2 and 3. The lever F is pivoted on a horizontal axis,  $l$ , to the forked upper end of an oscillating post or spindle, L, which has its bearing

on the vertical axis  $d$  in a fixed socket, M. This post is formed with a laterally-projecting arm, L', against which the spring K presses in order to impart to the lever F the requisite lateral tension for holding its roller  $g$  in contact with the cam D. On the upper side of the lever F, near its end  $e$ , is formed a cam-surface,  $k$ . (Shown in Fig. 3.) On the cam D is fixed a projecting arm or pin,  $m$ , which is so arranged relatively to the inclined plane  $c$  on the cam D and to the cam-surface  $k$  and roller  $g$  on the lever F that when the inclined plane  $c$  begins to act upon the roller  $g$  the pin  $m$  encounters the cam-surface  $k$  and presses downwardly thereupon, thereby tilting the lever F on its horizontal axis  $l$ , and consequently lifting the marking-point G off from the paper. As the movement of the cam D continues, the pin  $m$  continues to hold the lever F tilted as long as the inclined plane  $c$  is in engagement with the roller  $g$ , and releases and drops the lever at the instant when the inclined plane passes beyond the roller. Thus by this simple means the marking-point is held off from the paper whenever the inclined plane  $c$  is brought against the roller  $g$ ; hence if the cam D were rotated continuously in one direction the marking-point would describe a line upon the paper from one side of the concentric graduations  $yy$  to the other, and be then raised clear of the paper and moved back across the graduations to the starting-point, and again dropped upon the paper.

As the inclined plane  $c$  occupies an arc of only about twenty-five degrees, it will rarely happen that the wind will blow in such direction as to bring this portion of the cam against the roller, and consequently the indicating-line upon the paper will rarely be interrupted. However, the meteorologist will know, whenever the indicating-line passes to the margin of the graduations  $yy$  and is then interrupted, that the wind is blowing in the direction corresponding to the position of  $c$ , or, in the arrangement of graduations shown, in a direction between E and SE.

Fig. 5 illustrates a slight modification of the construction of the lever. The vertical spindle L has fixed to its upper end a lever or cross-head, L', against which the spring K bears, and on which is formed a fork,  $n$ , in which the lever F is fulcrumed on a horizontal axis,  $l$ . The operation is the same as already described. Many other constructions may be devised to accomplish the same result.

Fig. 6 illustrates my invention as used with a straight strip of paper, on which the recording is effected, instead of a graduated disk of paper. This strip is drawn through beneath the marking-point G by means of rollers  $r, r$ , driven by clock-work contained in a box, J.

The marking-point G may be a scoring or indenting point, a pencil-point, or a pen-point, as may be preferred.

I claim as my invention the following de-

fired novel features and combinations, substantially as hereinbefore specified, namely:

1. In an anemoscope, the combination of a wind-vane, a spiral cam connected to said vane and deriving rotary motion therefrom, a marking-point, and a mechanical connection between said marking-point and the periphery of said cam, whereby the rotation of the latter causes a lateral movement of said point.
2. In an anemoscope, the combination of a wind-vane, a spiral cam connected to said vane and turned thereby, a lever engaging the periphery of said cam, and a marking-point borne by said lever, whereby on the rotation of said cam the said lever is vibrated and motion is imparted to said marking-point.
3. In an anemoscope, the combination of a wind-vane, a spiral cam connected to said vane and turned thereby, a marking-point, and mechanical connection between said marking-point and the periphery of said cam, whereby the rotation of the latter imparts a proportional lateral movement to said point indicative of the angular position of the vane, a graduated paper or other recording medium, and clock-work for moving said paper beneath said marking-point in a direction approximately perpendicular to the direction of motion of said point.
4. In an anemoscope, the combination of a wind-vane, its rotary spindle, a spiral cam fixed on said spindle, a lever engaging the periphery of said cam, a marking-point borne by said lever, a graduated paper or other recording medium, and clock-work for moving said paper beneath said marking-point.
5. In an anemoscope, the combination of a wind-vane, a spiral cam connected to said vane and turned thereby, and formed on its periphery with an inclined plane, *c*, between the points of greatest and least projection at the opposite terminals of the spiral, a lever engaging the periphery of said cam, a marking-point carried by said lever, and means for lifting said marking-point while said inclined plane is in position to engage said lever, whereby while the lever is being vibrated by said inclined plane the marking is interrupted.
6. In an anemoscope, the combination of a wind-vane, a spiral cam connected to said vane and formed on its periphery with an inclined plane, *c*, a lever engaging the periphery of said cam, a marking-point carried by said lever, and coinciding projections on said lever and cam, respectively adapted, when the cam is in such position that its inclined plane engages said lever, to tilt said lever vertically and thereby lift said marking-point, whereby while the lever is being vibrated by said inclined plane the marking is interrupted.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WALTER H. CHILDS.

Witnesses:

FRED. W. CHILDS,  
GEO. H. BOND.