

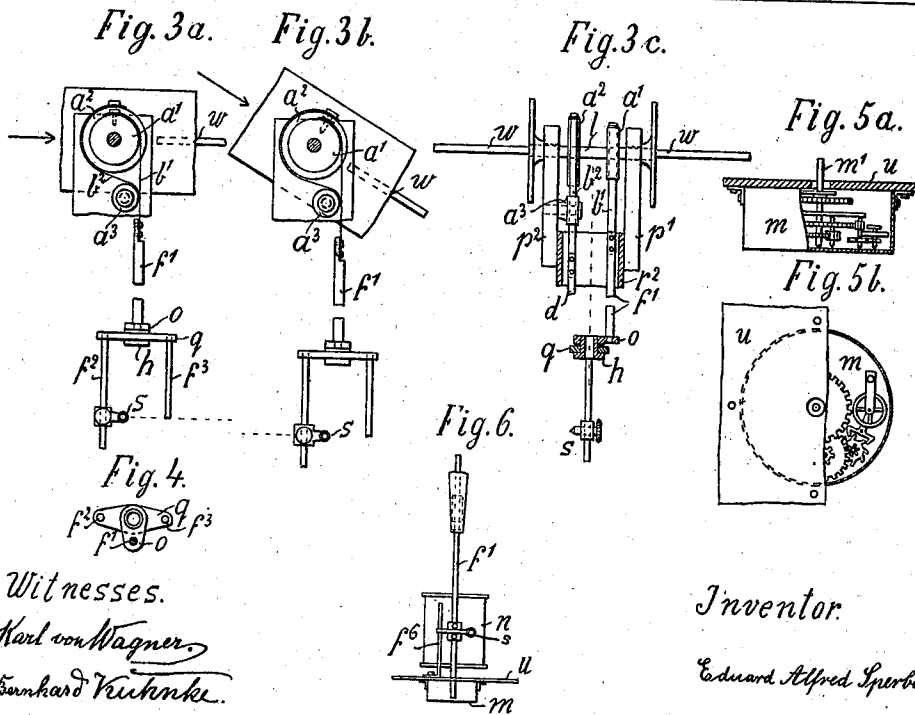
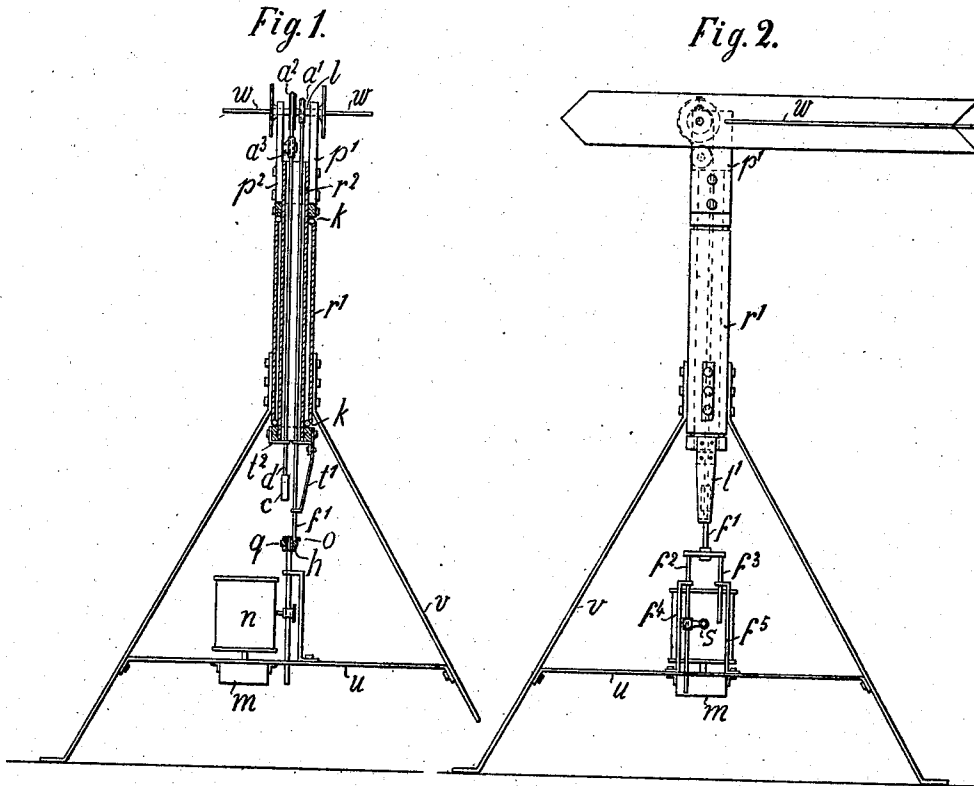
No. 858,310.

PATENTED JUNE 25, 1907.

E. A. SPERBER.

APPARATUS FOR AUTOMATICALLY RECORDING THE DIRECTION
OF THE WIND IN THE VERTICAL PLANE.

APPLICATION FILED JULY 29, 1904.



Witnesses.
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APPARATUS FOR AUTOMATICALLY RECORDING THE DIRECTION OF THE WIND IN THE VERTICAL PLANE.

No. 858,310.

Specification of Letters Patent.

Patented June 25, 1907.

Application filed July 29, 1904. Serial No. 218,762.

To all whom it may concern:

Be it known that I, EDUARD ALFRED SPERBER, a citizen of the Kingdom of Saxony, residing in Dresden, Germany, have invented an Apparatus for Automatically Recording the Direction of the Wind in the Vertical Plane, of which the following is a specification, reference being had to the accompanying drawings, forming part of this specification.

My invention concerns an apparatus for automatically recording the direction of the wind in the vertical plane by which, through the effect of the wind, on one or more vanes, a recording-apparatus is moved up and down and through this recording a curve on a record-drum which is turned by clockwork. Such an apparatus is shown in the accompanying drawing in which

Figure 1 is a front view, partly in section, Fig. 2, a side view, Figs. 3^a, 3^b, 3^c, 4, 5^a & 5^b, details of Figs. 1 and 2, Fig. 6, detail for a special arrangement of the recording-apparatus.

The apparatus, Figs. 1—6, consists of one or more vanes *w*, fastened at their center of gravity on a movable shaft *l* and a pulley *a*¹, fastened on the same shaft, holding a connecting-rod *f*¹, by means of a ribbon *b*¹ and serves directly or indirectly move a recording-apparatus *s*. A second pulley *a*² is fastened on the shaft *l*, and holds a rod *d*, by means of a ribbon *b*² and which rod is provided with a counterweight *c*. Pulley *a*³ guides the ribbon which is applied to pulley *a*². Tube *r*¹ is rigidly fastened to the frame *v* of the apparatus. Within tube *r*¹ a second tube *r*² is made rotatable on ball bearings *k* and having at its upper end plates *p*¹ and *p*² which form bearings for the shaft *l* and pulley *a*³ and having at its lower end the guides *t*¹ and *t*² for the rods *f*¹ and *d*. The recording of the curve showing the direction of the wind in the vertical plane is done on a record-drum *n* by means of the recording-apparatus *s*, actuated by rod *f*¹. The record-drum *n* must revolve and is therefore fastened to the shaft *m*¹ of a clockwork *m*, which is applied to plate *u*. The latter is fastened to the frame *v*, and carries the guiding-bows *f*⁴ and *f*⁵ or *f*⁶ and has a hole for the clock-shaft *m*¹ and for the rod *f*² Fig. 2 or *f*¹, Fig. 6.

The recording apparatus *s* is adjustably secured to rod *f*² which is fastened to a cross beam *g* and which rod is capable of a reciprocating

movement in the guides *f*⁴ and plate *u* being held from rotation by a rod *f*³ fixed to said cross beam *g* and reciprocating in a guide or bow *f*⁵, rigid with plate *u*. Cross beam *g* has a swivel connection with the lower end of the connecting rod *f*¹ consisting of a coupling box *h* having an opening there-through in alinement with the longitudinal axis of the tube *r*² and a lug *v* eccentric to said opening attached to the lower end of rod *f*¹. The cross beam *g* is sleeved in a groove formed by said coupling box, thus allowing said coupling box to freely rotate in said cross beam when the tube *r*² is rotated by the vanes. Another way of placing the recording-apparatus *s* may be seen in Fig. 6. The marker is rotatively secured to rod *f*¹, said rod coinciding with the axis of rotation of the tube *r*², the marker being prevented from rotating with rod *f*¹ by the fixed rod *f*⁶, which is fastened to the plate *u*.

The operation of the device is as follows: By the pressure of the air currents on the vanes, the latter are actuated to place themselves in planes parallel with said currents, see Figs. 3^a and 3^b, thus producing a rotation either of the tube *r*² or shaft *l* or both. A rotation of shaft *l* and consequently of the pulleys *a*¹ and *a*² fastened to it causes a winding off or on of the ribbon *b*¹ attached to pulley *a*¹. The rod *f*¹ attached to ribbon *b*¹ is thus caused to reciprocate vertically in proportion to the degree of rotation of the vanes on shaft *l*.

In consequence of its own weight and that of the parts attached to it, the rod *f*¹ always tends to rotate shaft *l*. In order to counter-balance this tendency, the pulley *a*² is provided with a rod *d* attached to a ribbon *b*² with counter-weight *c*. The ribbon *b*² works on this pulley in the contrary direction to the ribbon on pulley *a*¹ and is guided in its lower part by the pulley *a*³.

In this construction the length of the movement up or down of the rod *f*¹ is constant for each degree or unit of variation of the direction of the wind in the vertical plane. As opposed to an arrangement in which the rod *f*¹ is moved by a lever, this construction has the advantage not to record the curve in a variable measure.

The variation in the direction of wind in regard to the 4 points of the compass is taken into consideration by arranging tube *r*² revoluble in tube *r*¹ and by arranging the

recording-apparatus moved by rod f^1 in such a manner as to be affected only by the perpendicular movements of the vanes.

In order to measure the curve recorded, properly ruled paper is wound upon drum n .

What I claim as my invention, and desire to secure by Letters Patent, is—

An apparatus for automatically recording the direction of the wind in a vertical plane comprising a rotatably supported tube having supporting plates fixed thereto at one end, a horizontal shaft rotatably journaled in said supporting plates, one or more vanes fixed to said shaft to rotate therewith, two pulleys also fixed on said shaft, a counter-

weight connected with one of said pulleys, a guided rod suspended from the other of said pulleys and reciprocating according to the degree of rotation of said vanes in a vertical plane, a time rotated record drum and a marker coacting therewith and adjustably carried by said guided rod substantially as described.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EDUARD ALFRED SPERBER.

Witnesses:

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PAUL ARRAS.