No. 751,514. PATENTED FEB. 9, 1904.

H. A. HUNT.

RECORDING ANEMOMETER.

APPLICATION FILED MAR. 11, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

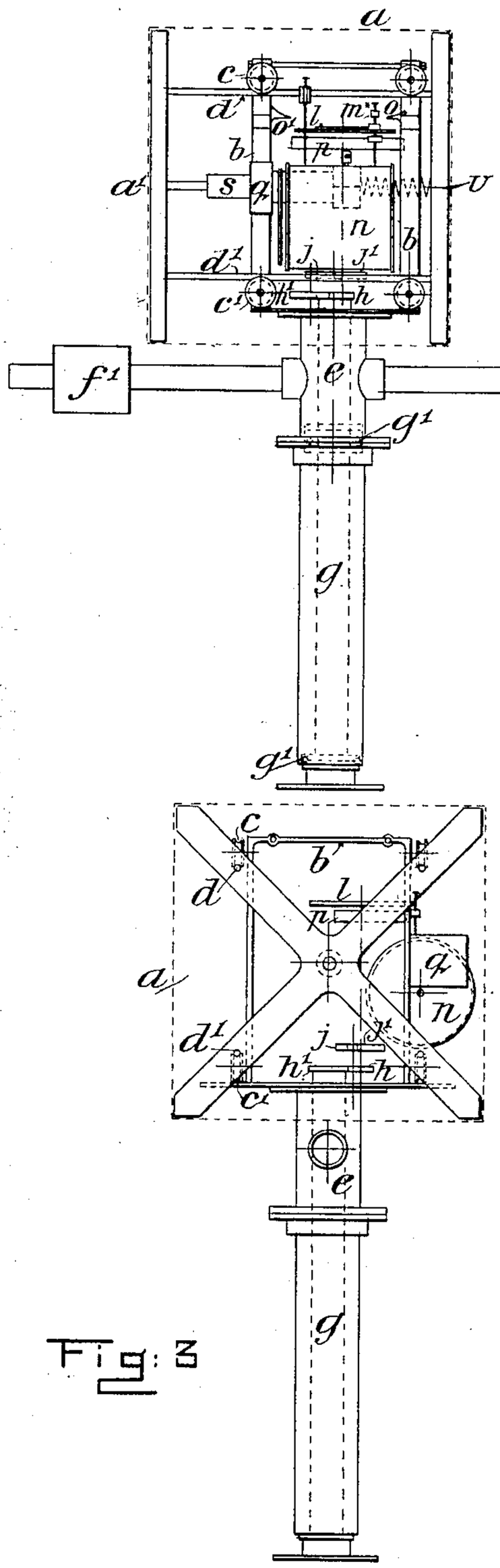


Fig: 2

Fig: 3

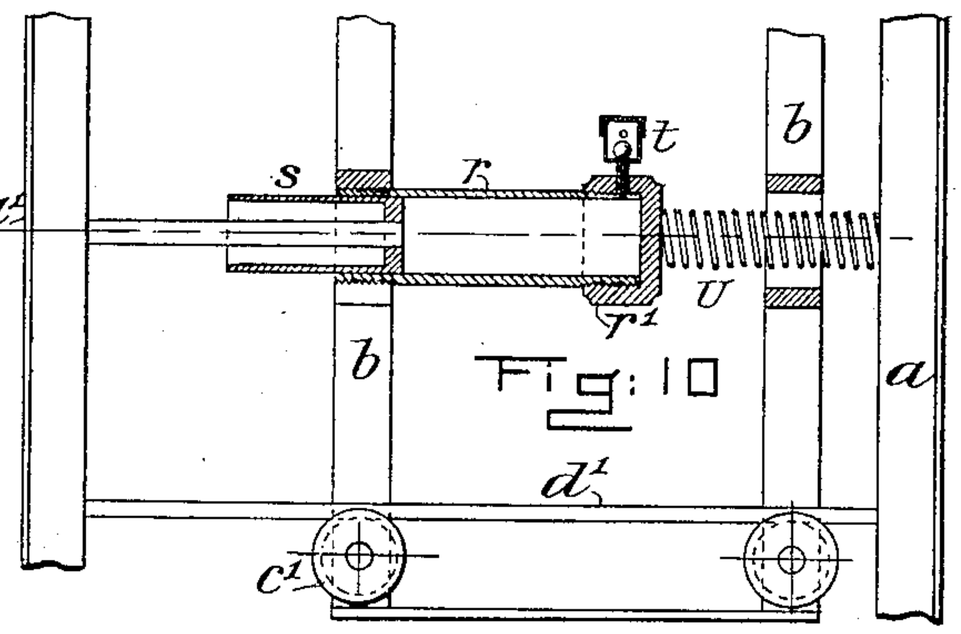


Fig: 10

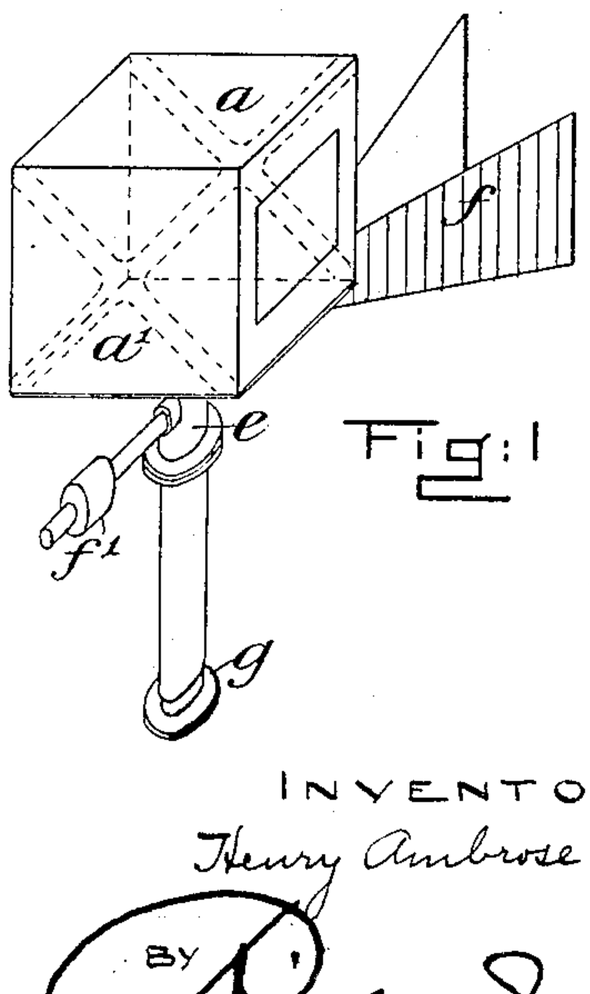


Fig: 1

WITNESSES

H. M. Kuehne

John A. Percival

INVENTOR

Henry Ambrose Hunt

BY Richardson

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,514. PATENTED FEB. 9, 1904.

H. A. HUNT.

RECORDING ANEMOMETER.

APPLICATION FILED MAR. 11, 1903.

NO MODEL. 3 SHEETS—SHEET 2.

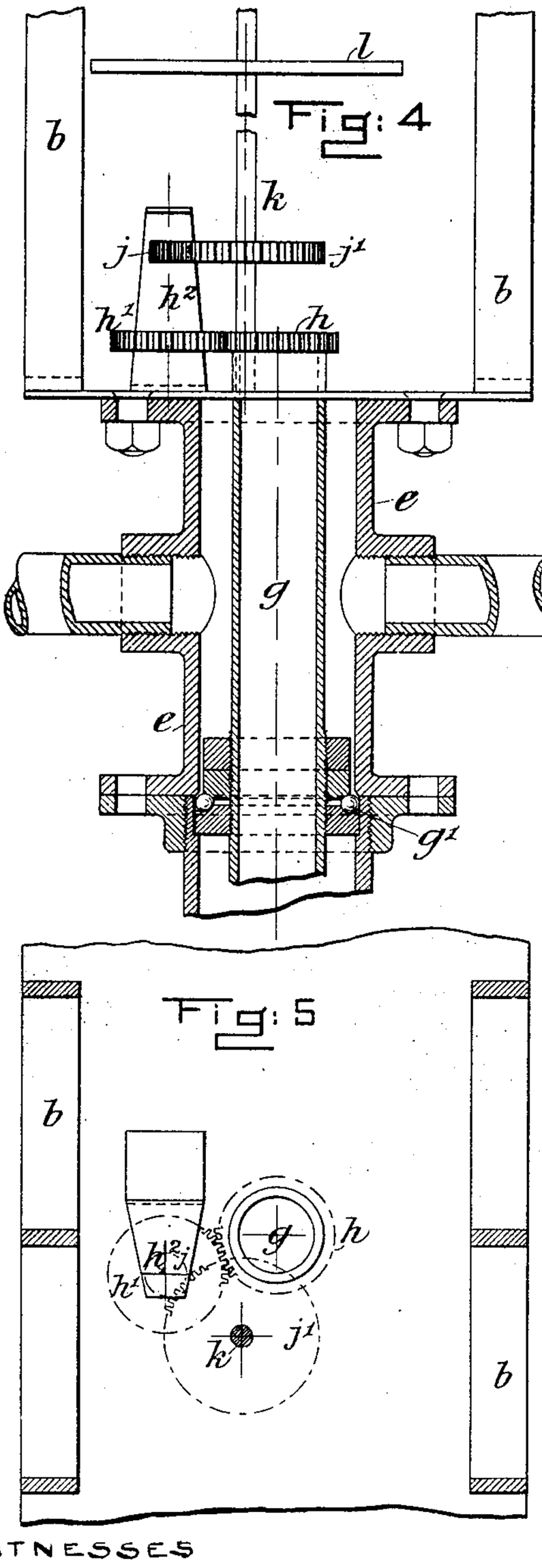


Fig: 5

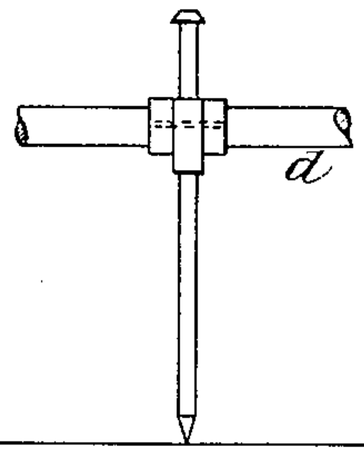
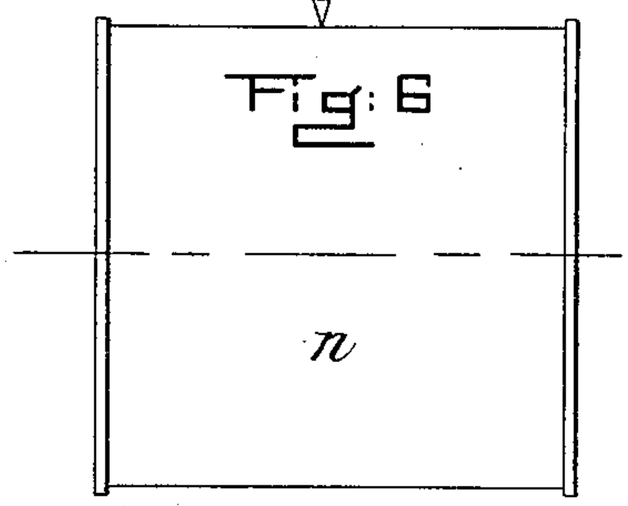


Fig: 6



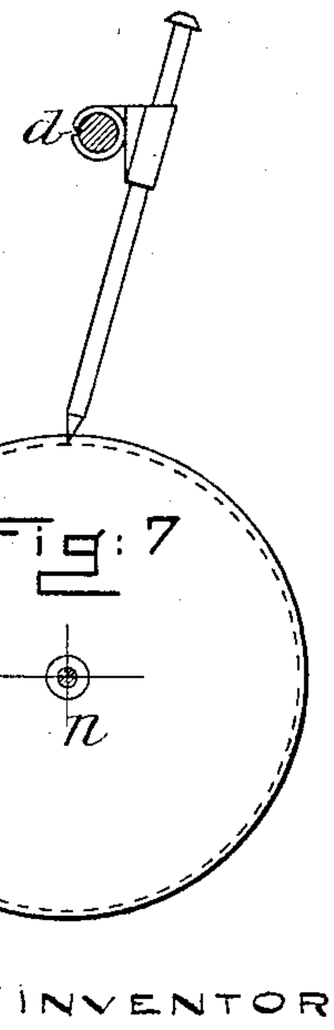


Fig: 7

WITNESSES

H. M. Kuehne

John A. Perewah

INVENTOR

Henry Ambrose Hunt

BY Richards & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,514. PATENTED FEB. 9, 1904.

H. A. HUNT.

RECORDING ANEMOMETER.

APPLICATION FILED MAR. 11, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

Fig: 8

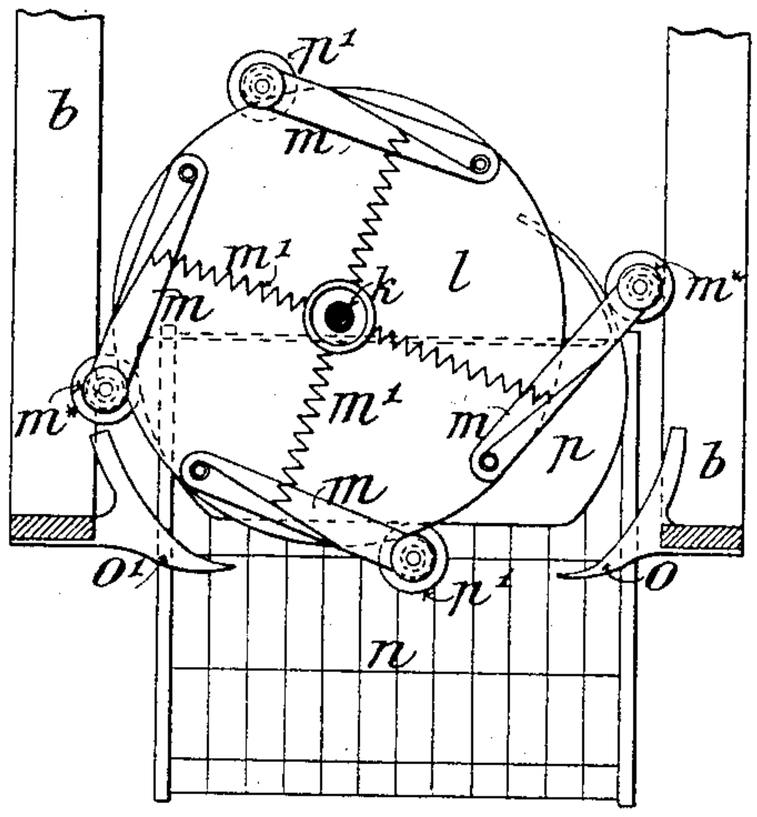
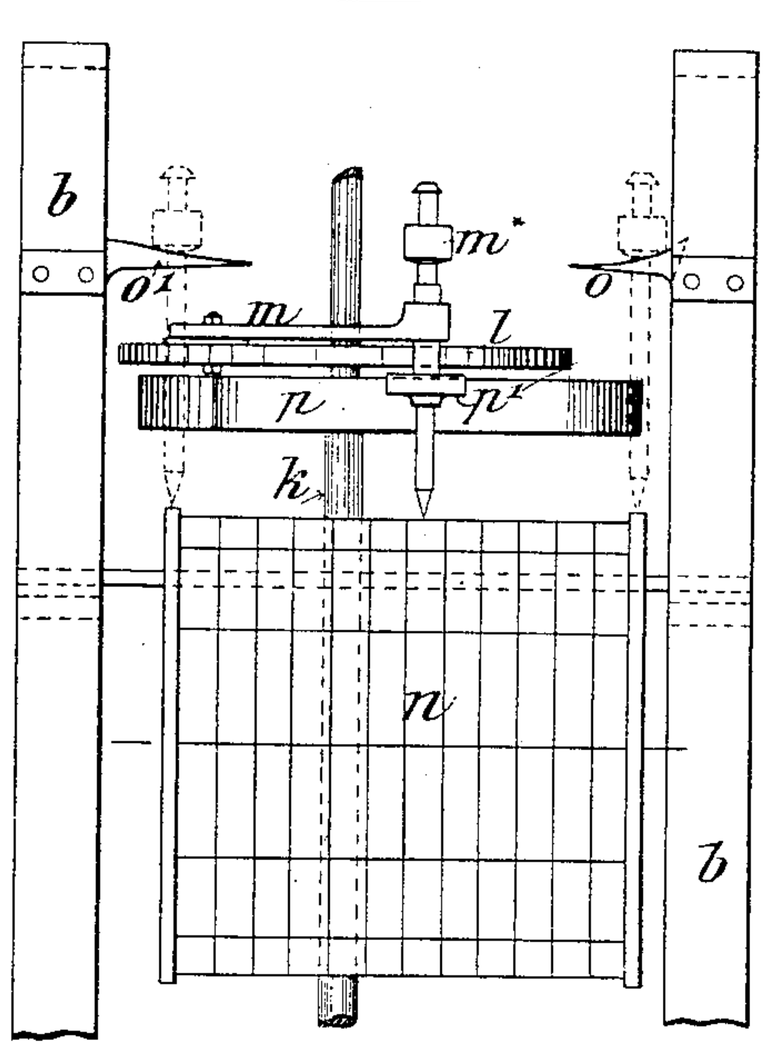


Fig: 9



WITNESSES

H. M. Kuehne

John A. Percival

INVENTOR

Henry Ambrose Hunt

By Richardson & Co

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,514. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

HENRY AMBROSE HUNT, OF MARRICKVILLE, NEW SOUTH WALES, AUSTRALIA.

RECORDING-ANEMOMETER.

SPECIFICATION forming part of Letters Patent No. 751,514, dated February 9, 1904.

Application filed March 11, 1903. Serial No. 147,234. (No model.)

To all whom it may concern:

Be it known that I, HENRY AMBROSE HUNT, a subject of the King of Great Britain and Ireland, and a resident of Warren road, Marrickville, in the State of New South Wales, Commonwealth of Australia, have invented a certain new and useful Registering Anemometer, of which the following is a specification.

As its name implies, this invention is for the purpose of measuring wind-pressures, together with the direction from which the wind blows, and for graphically registering the same.

The main features of the invention are, first, a pivoted hollow cube adapted to present one side constantly to the direction from whence the wind is blowing; second, a pneumatic recoil-checker; third, special appliances for graphically recording the direction of the wind.

In order that the invention may be properly understood, reference is made to the accompanying sheets of drawings, in which—

Figure 1 is an isometrical projection of the hollow cube and the vane for turning the front side of the cube toward the wind. Fig. 2 is a side elevation of the hollow cube with the sides removed to show the internal mechanism. Fig. 3 is a front elevation of the same. Fig. 4 is a partial side elevation of the same, on a larger scale, showing the geared connection of the mechanism with the vane. Fig. 5 is a partial plan view of the same. Fig. 6 is a side elevation of the pencil attachment for recording the pressure of the wind. Fig. 7 is an end elevation of the same. Fig. 8 is a plan of the mechanism for recording the direction from which the wind blows. Fig. 9 is a side elevation of the same. Fig. 10 is a longitudinal vertical section of the pneumatic plunger and air-valve and recoil-spring.

a is the hollow cube, which should be made of some standard size in order to facilitate calculation. It is provided with an internal fixed frame *b*, on which are eight guide-rollers *c c'*, four on each side, four being near the top and four near the bottom of the frame. These guide-rollers *c c'* engage with tie-rods *d d'*, that connect together the front and back faces of the cube, the rollers *c c'* and the rods *d d'* being adapted to allow the cube *a* to slide backward and forward freely with the varying pressure of the wind against the front face *a'*. The internal frame *b* is rigidly connected to a sleeve *e*, that carries the vane *f* and counterweight *f'*, whereby the front face *a'* of the cube *a* is maintained in a position facing the wind.

Within the sleeve *e* is a fixed spindle *g*, upon which the sleeve *e* rotates on ball-bearings *g'*. The extreme top end of the fixed spindle *g* is provided with a toothed ring *h*, (see Figs. 4 and 5,) that gears with an equal-sized spur-wheel *h'* on a counter-shaft h^2, which also carries a pinion *j*, that gears with a spur-wheel *j''* on a vertical shaft *k*. Upon this vertical shaft *k* is keyed a pencil-carrying disk *l*. (See Fig. 8.) Near the periphery of the disk *l* are pivoted arms *m m*, the opposite ends of which carry the pencils that mark the direction of the wind upon the recording-cylinder *n*. The pencils are caused to bear against the recording-surface of the recording-cylinder by weights m^* and against the periphery of the disk *l* by radial springs *m' m'*. (See Figs. 8 and 9.) As the pencils would be caused (by the rotation of the disk *l*) to foul the flanged ends of the recording-cylinder *n*, circular inclines *o o'* are provided at each end of the cylinder, but attached to the fixed inner frame *b*, and these inclines will have the effect (due to the rotation of the disk *l*) of raising the pencil-points about one-eighth of an inch above the recording-surface of the cylinder, as shown by dotted lines at Fig. 9.

Underlying the disk *l* is a cam-face *p*, (attached to the frame *b*,) the ends of which are formed as regular curves, the intermediate space being a straight line parallel with the axis of the recording-cylinder *n*. The pencil-carriers *m m* are provided with antifriction-rollers *p' p'*, which will bear against the cam-face *p*, and thus the pencils shall be caused to trace a straight line upon the paper-surface of the recording-cylinder. The recording-cylinder *n* is caused to make one complete revolution in every twenty-four hours. This is effected by means of ordinary clockwork,

which is inclosed in a box *q*. All the above description has reference only to the appliances for recording the direction of the wind. The wind-pressures are gaged by independent means to be described.

Fig. 10 shows a part of the means adopted for attaining the desired end. A cylinder *r* is rigidly secured to the internal frame *b*. The piston or plunger *s*, which freely slides therein, is secured to the front frame of the hollow cube *a*. The rear end of the cylinder *r* is closed by a screw-cap *r'*, which carries a ball-valve *t*, that allows the air to escape from the cylinder *r* when the piston *s* is pushed up by the force of the wind on the front face *a'* of the cube *a*. Intermediately between the screw-cap *r'* and the rear frame of the hollow cube *a* is a helical spring *u* in tension, the same being adapted to force back the main frame of the cube *a* when the wind-pressure diminishes or altogether ceases. When the wind-pressure upon *a'* forces back the piston *s* into the cylinder *r*, the air in the cylinder will quickly escape through the valve *t;* but on the wind-pressure diminishing or ceasing the coil-spring *u* will draw the frame of the cube *a* (and with it the piston *s*) forward toward its original position, the pneumatic appliance *r s* acting as a buffer to prevent shock on the recoil. Air is again admitted to the cylinder *r* behind the piston *s* by leakage in any suitable manner round or through the piston. The backward and forward movement of the cube *a*, due to the varying wind-pressures upon the front face *a'* of the cube, are recorded upon the surface of the recording-cylinder *n* in the following manner: The recording-cylinder *n* revolves in bearings in the inner frame *b*, and therefore has no lateral movement. The pressure-recording pencil is shown in Figs. 6 and 7 and is secured to the upper tie-bar *d* of the frame of the cube *a*, and therefore moves backward and forward with the cube, at the same time marking upon the recording-surface of the cylinder *n* a straight line, (modified only by the rotation of the cylinder *n*,) thus indicating graphically by the length of the line traced the amount of wind-pressure exercised upon the face *a'* of the cube *a*.

On account of the cubical or solid form of the cube-box *a*, with winds of high velocity there will be not only a direct wind-pressure upon the front face *a* of the cube-box *a*, but there will also be a certain amount of suction operating to draw the back face of the box *a* rearward. In making the necessary calculations to find the amount of wind-pressure exerted this rear sucking action must be taken into consideration in combination with the direct pressure on the front face.

The underneath side of the cube-box *a* must be slotted in order to allow the box to slide freely past the sleeve *e*. In order to exclude dust and dirt from the interior of the box *a*, the aperture may be covered by a bag or other flexible covering. A door must also be placed in one side of the box, as shown in Fig. 1, to facilitate the removal of the recording-cylinder and other parts which may require changing or adjustment.

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

1. An anemometer comprising a recording-cylinder, a hollow cube arranged to turn, and vanes associated with the hollow cube to turn the same with one face constantly to the direction from whence the wind is blowing, and means connected with said cube for marking the direction of the wind on the recording-cylinder, said cylinder and marking means being situated in the cube.

2. An anemometer comprising a recording-cylinder, a hollow cube adapted to turn one face constantly to the direction from whence the wind is blowing, a vertical spindle upon which the cube is mounted, said cube being susceptible of lateral movement in relation to the spindle and the extent of such lateral movement varying with the wind-pressure, and means for marking on said cylinder the extent of said lateral movement, substantially as described.

3. An anemometer consisting of a recording-cylinder, of a hollow cube adapted to turn one face constantly to the direction from whence the wind is blowing, a fixed inner frame upon which said cube may slide laterally, a vertical revolving part upon which the inner frame is rigidly fixed, means for maintaining the front face of the hollow cube toward the wind, and means for indicating on the recording-cylinder the extent of the lateral movement of the cube, substantially as described.

4. An anemometer consisting of a recording-cylinder, of a hollow cube adapted to turn one face constantly to the direction from whence the wind is blowing, a plunger arranged internally of the said cube, a fixed inner frame, a cylinder attached thereto in which the plunger works and an escape-valve for the said cylinder, said hollow cube being slidably mounted on the said fixed inner frame and being controlled by the piston, cylinder and air-valve, and means for indicating on the recording-cylinder the extent of movement of the cube on the fixed inner frame, substantially as described.

5. A registering-anemometer consisting of a hollow cube adapted to turn one face constantly to the direction from whence the wind is blowing, in combination with a fixed inner frame, upon which the cube may slide laterally, and with a pencil-carrying disk provided with arms, pencils carried thereby, lifting-cams for lifting the pencils, a cam-face against which the pencils will impinge, a recording-cylinder carried by the inner frame and clock-work for operating the cylinder, all for the purpose of graphically recording the directions

from whence the wind has been blowing as herein set forth.

6. A registering-anemometer consisting of a hollow cube adapted to turn one face constantly to the direction from whence the wind is blowing, in combination with a fixed inner frame, upon which the cube may slide laterally, a pencil secured to any suitable part of the hollow cube and a recording-cylinder, carried by the inner frame and clockwork for operating the cylinder, all for the purpose of graphically recording the varying wind-pressures that have been acting upon the front face of the hollow cube as herein specified.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HENRY AMBROSE HUNT.

Witnesses:

TERRY W. BERNE,

MANFIELD NEWTON.