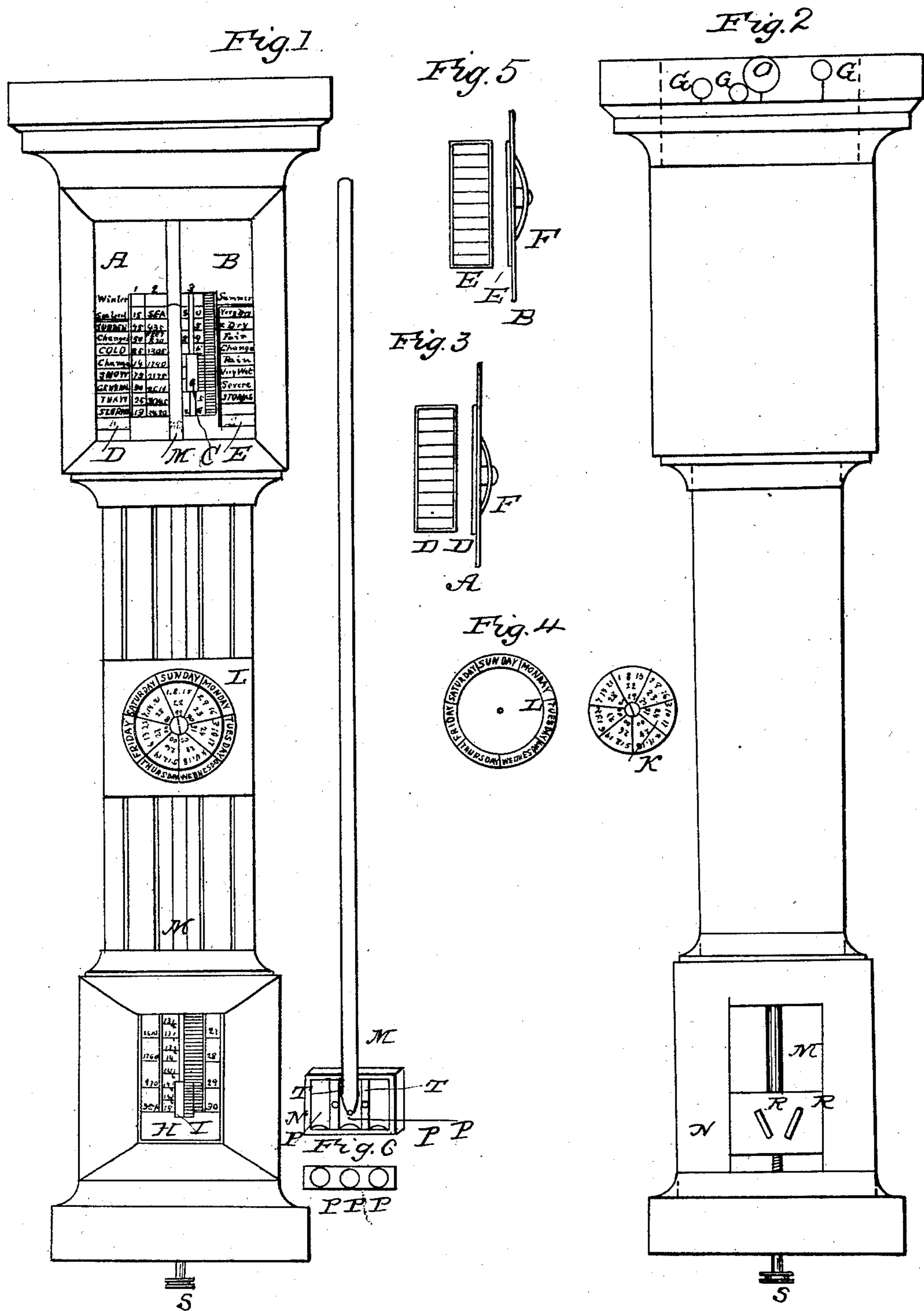


H. A. CLUM.

Barometer.

No. 28,454.

Patented May 29, 1860.



UNITED STATES PATENT OFFICE.

HENRY A. CLUM, OF AUBURN, NEW YORK.

BAROMETER.

Specification of Letters Patent No. 28,454, dated May 29, 1860.

To all whom it may concern:

Be it known that I, HENRY A. CLUM, of Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in the Mercurial Barometer; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, like letters referring to like parts.

Figure 1 represents a front view of my barometer. Fig. 2 represents a back view of the same. Figs. 3, 4, 5 and 6 are parts to be hereafter described.

The nature of my invention consists in applying to the ordinary tube and cistern barometer movable meteorological slides as shown at D and E whereby the "Dry," "Fair," "Change," &c., on E, and "Cold," "Change," "Snow," &c., on D, can be raised or lowered, so as to adjust the barometer to various altitudes, as the mercury in the tube rises or falls, in consequence of the barometer being taken below, or above sea level. This variation in the mercurial column being equal to about one inch to 870 feet of altitude above sea level. Thus the average reading of the mercury at sea level is about 30 inches; at the city of Auburn it is about 29 inches, and in many places in the United States it sinks to an average 28, 27 and even lower in high agricultural districts. It will be noticed therefore, that the meteorological reading in ordinary barometers, is in such localities useless, in that in one position the mercury would average "Change;" in another, "Rain;" in another, "Fair," and still in another "Stormy," while at the level of the sea, or in the tide water districts it averages "Dry;" it being at the same time dry in all these localities. The removal of the above named objections and difficulties is the aim of the adjustable meteorological slides.

My improvement further consists in an arrangement at the bottom of the barometer, termed the cistern adjustment which consists of plate H, Fig. 1, having marked thereon 28, 29, 30, &c., inches, divided into tenths, and by vernier I again into hundredths; also on the left hand of the vernier I on the same plate the approximate number of feet, corresponding with the inches above sea level, together with the average atmospheric pressure per square inch. The ob-

ject of this arrangement is, that after the average reading of the mercurial column shall have been determined by observation of the upper vernier C, the adjustment may be transferred to the face below, when the slides above may be brought up again to the sea level standard. For example, the mercury is found to average a reading of 29 inches. This would require the slides D, E to be dropped one inch, as the position would be about 870 feet above sea level; the mercurial column being in motion, as the atmosphere changes, it is desirable to transfer that average reading to a permanent index below. This is done by raising the cistern N, and tube M, which carry the vernier I on the lower face with them (that vernier being attached to the cistern) as high as the mercury in the tube above averages below 30 inches which in this supposition is one inch, and let it there remain. The reading at the bottom would then be 29 inches, indicating an altitude of about 870 feet above sea level, and the atmospheric pressure about 14½ pounds per square inch. The tube and cistern are raised by means of screw S running through the bottom of the case, and also prevents them from lowering, or leaving their place. By this arrangement, the average atmospheric pressure, and the approximate height above sea level, can be seen at a glance, while the face above remains in its sea level position.

My improvement further consists in a cistern, so arranged as to admit of the instrument being conveyed from place to place, without the injuries incident to ordinary barometers. This cistern shown at N, Fig. 2, and a section of the same in Fig. 6, is a block of hard wood, with two or more cylindrical cells as shown at P, P, P, Fig. 6. Into one of these cells the tube is fixed, and the mercury can flow from one cell to another through the opening T, T, Fig. 6, when the stop cocks R, R, are opened. Hence by laying the instrument on one edge the tube M can be readily filled with mercury and the stop cocks being then closed the instrument may be carried without danger of the tube being fractured. When the instrument is again put up, the stop cocks are opened, and the sinking mercury allowed to flow into the side chambers, or cells. The instrument is then ready for use.

Figs. 3 and 5 show the manner in which the meteorological slides D, and E, are kept

tightly against the faces of the bed pieces A and B, by means of springs F, F, which press against the back of the bed pieces immediately behind slots in the same, and through which passes a piece of brass attached to the slides, and to which the spring is fixed by a pin, as shown in the drawing.

The slides D, and E, and the vernier C, are moved up, and down, by means of wires shown at G, G, G, Fig. 2.

O, Fig. 2 is a ring by which the instrument is suspended.

The vernier I in the lower plate Fig. 1, is attached to the cistern and is moved upward, and downward with the same. The lower edge of this vernier is level with the surface of mercury in the cistern, when the instrument is in working order.

The cistern is made, by simply boring holes, or cells, in a piece of hard wood, and often the tube is filled and mercury put into the cistern as required, the holes are closed by corks or wooden heads glued in.

What I claim as my invention, and desire to secure by Letters Patent, is the following:

1. The movable slides D and E with meteorological reading only, separate, and de-

tached from any graduations for vernier purposes, for summer and winter purposes, as substantially shown, and described.

2. The application of heights, above sea level, of atmospheric pressure &c to the ordinary barometer face as shown in Fig. 1 columns 1 and 2, on the bed pieces A and B.

3. The cistern as shown in Fig. 6, consisting of two or more chambers connected by stop cocks, at points above the open end of tube.

4. The entire cistern adjustment as shown at H Fig. 1, and N, M, R, R, S, Fig. 2, consisting of the connection of the vernier I, to the cistern, which allows it to move with the cistern and tube, and also the movable cistern, as fully represented in drawings.

5. The combination of two meteorological slides D, and E, for winter and summer purposes, to the ordinary parlor barometer. The cistern adjustment, as described with the cistern, and further bottom adjustment as shown on face H, Fig. 1, all as fully and substantially set forth.

HENRY A. CLUM.

Attest:

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