No. 639,935. Patented Dec. 26, 1899.

F. RENZO.

HYGROSCOPE.

(Application filed July 10, 1899.)

(No Model.)

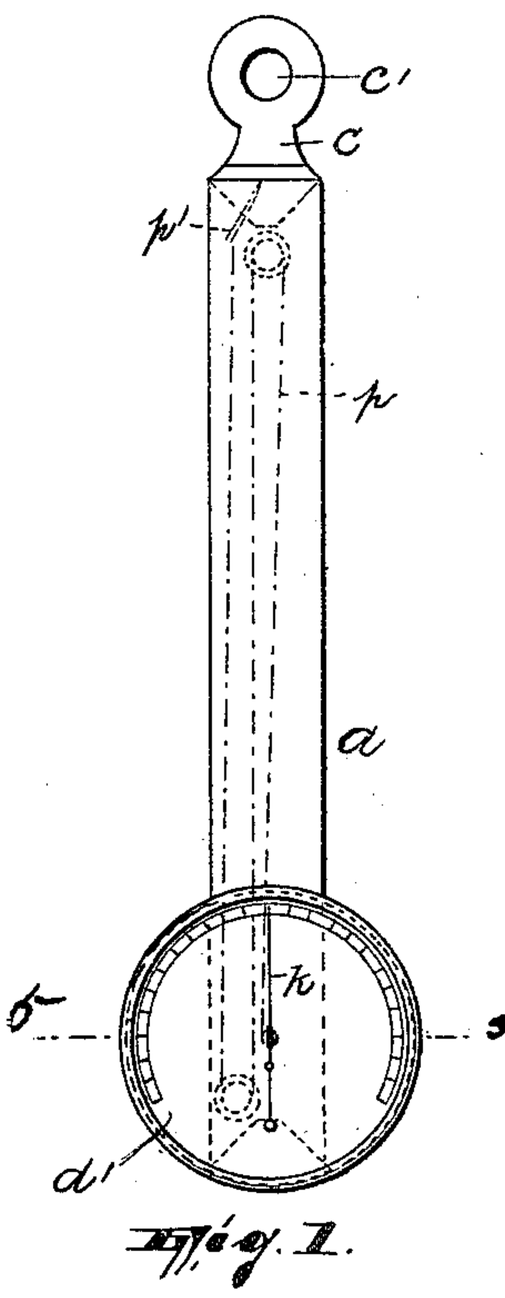

Fig. 1.

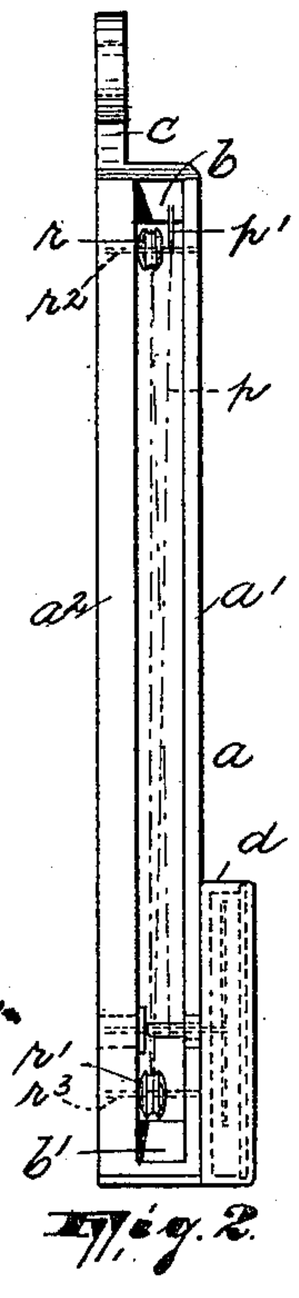

Fig. 2.

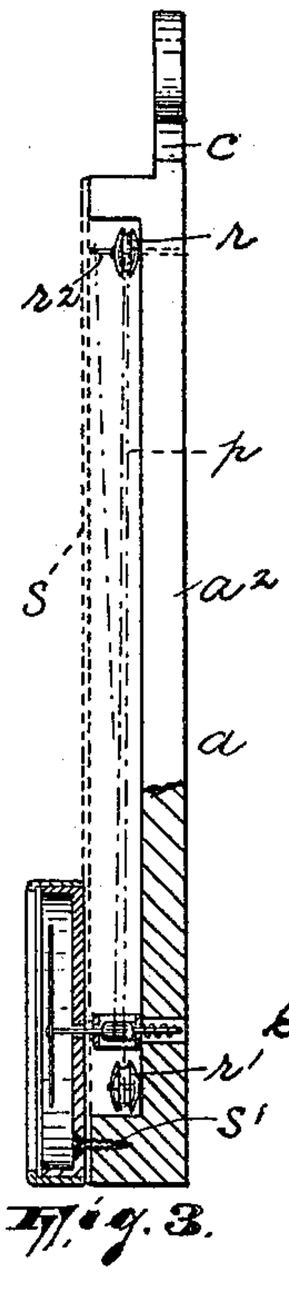

Fig. 3.

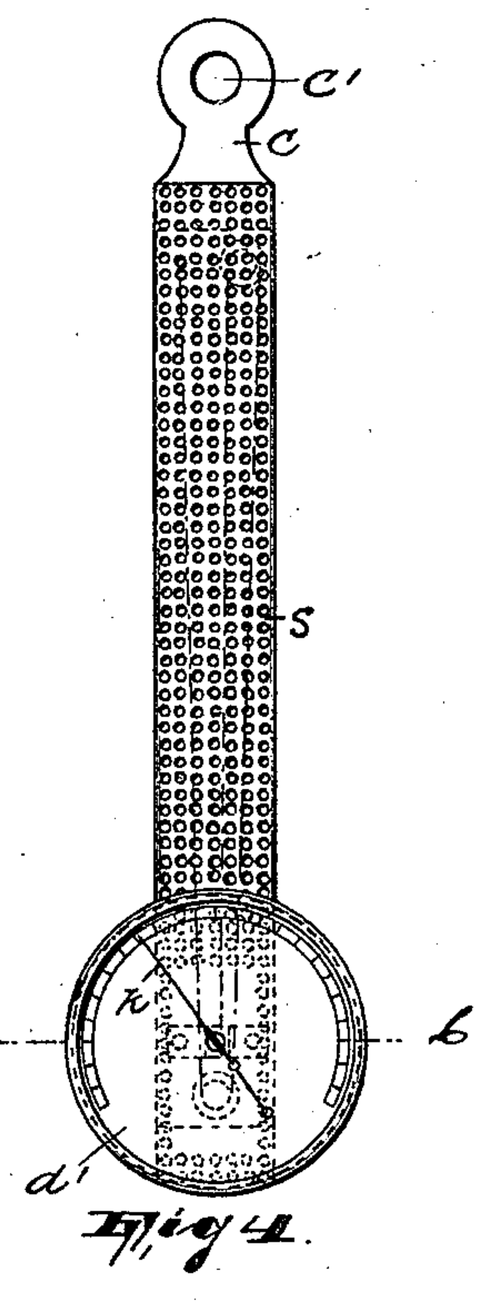

Fig. 4.

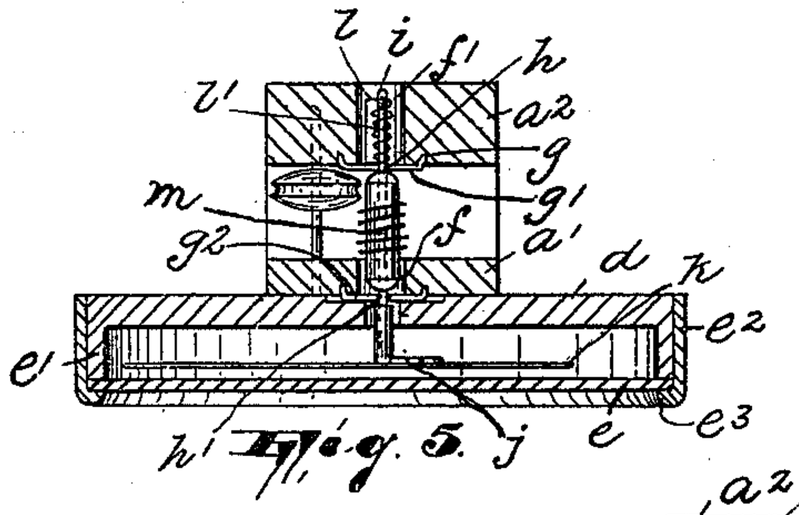

Fig. 5.

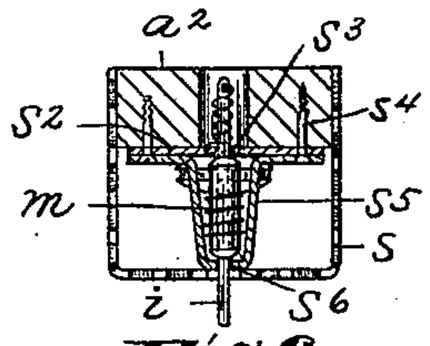

Fig. 6.

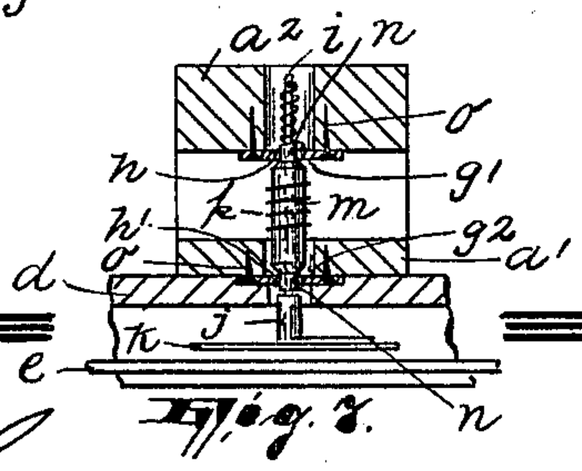

Fig. 7.

WITNESSES:

Wm. D. Bell.

Jas. B. Newton

INVENTOR,

Francesco Renzo.

BY

Gartner & Steward,

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANCESCO RENZO, OF PATERSON, NEW JERSEY.

HYGROSCOPE.

SPECIFICATION forming part of Letters Patent No. 639,935, dated December 26, 1899.

Application filed July 10, 1899. Serial No. 723,316. (No model.)

To all whom it may concern:

Be it known that I, FRANCESCO RENZO, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Hygrometers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of instruments technically known as "hygrometers" or "hygroscopes," adapted for measuring the quantity of moisture in the atmosphere and commonly employed for indicating variations in the weather, and it has reference particularly to a hygrometer or hygroscope in which a hair or other similar filament adapted for the purpose is employed as the hygro-expansible element for controlling the pointer or other similar indicating element.

The object of the invention is provide an instrument of the character above particularly referred to which shall be very simple and inexpensive in construction and yet accurate in operation and well adapted in every particular to the purposes for which it is intended.

The invention consists in the improved hygrometer or hygroscope and in the combination and arrangement of its various parts, substantially as will be hereinafter pointed out and finally embodied in the clauses of the claim.

The invention is fully illustrated in the accompanying drawings, wherein—

Figure 1 is a face view of one form of my improved hygrometer. Fig. 2 is a view in side elevation thereof. Figs. 3 and 4 are respectively a side view and a face view of another or modified form of my invention, a portion of the device as illustrated in the former figure being shown in section. Figs. 5 and 6 are transverse sectional views, respectively, of the two above-mentioned forms of my invention, the view in Fig. 5 being taken on the line 5 5 of Fig. 1 and the view in Fig. 6 being taken on the line 6 6 in Fig. 4; and Fig. 7 is a transverse sectional view of one of the forms of my invention, especially illustrating a modification of a certain detail portion thereof.

a in said drawings designates a frame consisting of front and back parallel-spaced walls a' a^2, connected at their ends by walls *b b'*, the rear wall having an extension *c* at its upper end provided with an opening c', whereby the device may be hung in any suitable place. Upon the face of the front wall a' and near its lower end is secured in any desired manner a circular glazed dial-case *d*, containing a dial d', the glass *e* of said case resting upon the rim e' of the latter, being secured thereto by a band e^2, which snugly fits said case and has an inwardly-projecting flange e^3 extending over the edge of and bearing upon the glass.

f and f' are alined apertures extending through the walls a' a^2, respectively, of the frame, said apertures being in line with the center of the dial-case *d*. On the inner side of wall a^2 and over the aperture *f*, therein and between the outer face of the wall a' and the adjacent face of the dial-case *d* and over the aperture in said wall a' are respectively secured, by means of integral spurs *g* at their corners, small metallic bearing-plates g' g^2, having alined openings *h h'*, respectively.

i is an elongated spindle which extends through the apertures *f* f' and through the openings *h h'* of the bearing-plates. One end of this spindle protrudes into the dial-case and carries an angular arm *j*, to which is soldered or otherwise secured a hand or pointer *k*. The other end of said spindle is provided with a slit *l*, into which projects one end of a spiral spring l', that is coiled about the spindle, and the other of whose ends is immovably secured between the bearing-plate g' and the wall a^2.

m is an arbor that is carried by the spindle *i*, being penetrated thereby and being just long enough so that it extends approximately from one bearing-plate to the other, having contact therewith.

In the modification shown in Fig. 7, with the idea of providing a bearing for the spindle *i*, which is not likely to be affected by the rusting of its parts, I form the bearing-plates g' g^2 of ivory, bone, or some other non-metallic substance and the arbor *m* of a simi-

lar substance, the latter being provided with integral bushings or reduced extensions n at its ends, which have bearings in the openings h h' of said bearing-plates. In this instance the bearing-plates may be secured in position by screws or pins o.

The pointer is adapted to be moved by the expansion and contraction of a strand of hair or other similar filament p, one end of which is secured permanently to a pin p', extending from the wall b, its other end being coiled about and suitably secured to the arbor m, said hair or filament first extending over pulleys r r', journaled on spindles r^2 r^3, respectively disposed near each end of the frame and connecting the walls a' a^2.

In the modification of my invention shown in Figs. 3, 4, and 6 the wall a is wanting, and in its place is substituted an elongated and three-walled perforated casing s, which may be secured to the frame in any desired manner. In this instance the dial-case rests upon the lower end of this casing, being secured to the lower end of the frame, with said casing between it and the frame, by means of screws s'. Bearings for the arbor m are provided in a plate s^2, having an opening s^3 for the spindle, and secured in position by screws s^4 to the inner face of the wall a^2 and by an arch-shaped plate s^5, also having an opening s^6 for said spindle and likewise secured in position by said screws s^4.

I do not wish to be limited to the exact construction which I have hereinbefore set forth; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. A hygrometer consisting of a suitable elongated frame, a dial carried by said frame, a revoluble spring-actuated spindle penetrating the dial, an elongated perforated casing mounted on said frame and projecting between the same and the dial at one of its ends, an arbor carried by said spindle, bearing-plates for said arbor secured to said frame, a hand or pointer carried by the spindle opposite the dial, pulleys arranged near each end of the casing and within the same, and a hair or other similar hygro-expansible filament coiled about said arbor at one of its ends and secured thereto, and extending over said pulleys and suitably secured at the other of its ends to the frame, substantially as described.

2. A hygrometer consisting of a suitable elongated frame, a dial carried by said frame, a revoluble spring-actuated spindle penetrating the dial, an arbor carried by said spindle, a hand or pointer carried by the spindle opposite the dial, said dial being disposed near one end of the frame, pulleys arranged near each end of said frame, said arbor being composed of ivory or similar non-metallic substance and having bearings in the frame, and a hair or other similar hygro-expansible filament coiled about said arbor at one of its ends and secured thereto, and extending over said pulleys and suitably secured at the other of its ends to the frame, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of June, 1899.

FRANCESCO RENZO.

Witnesses:
ALFRED GARTNER,
LOUISE SNYDER.