

No. 706,112.

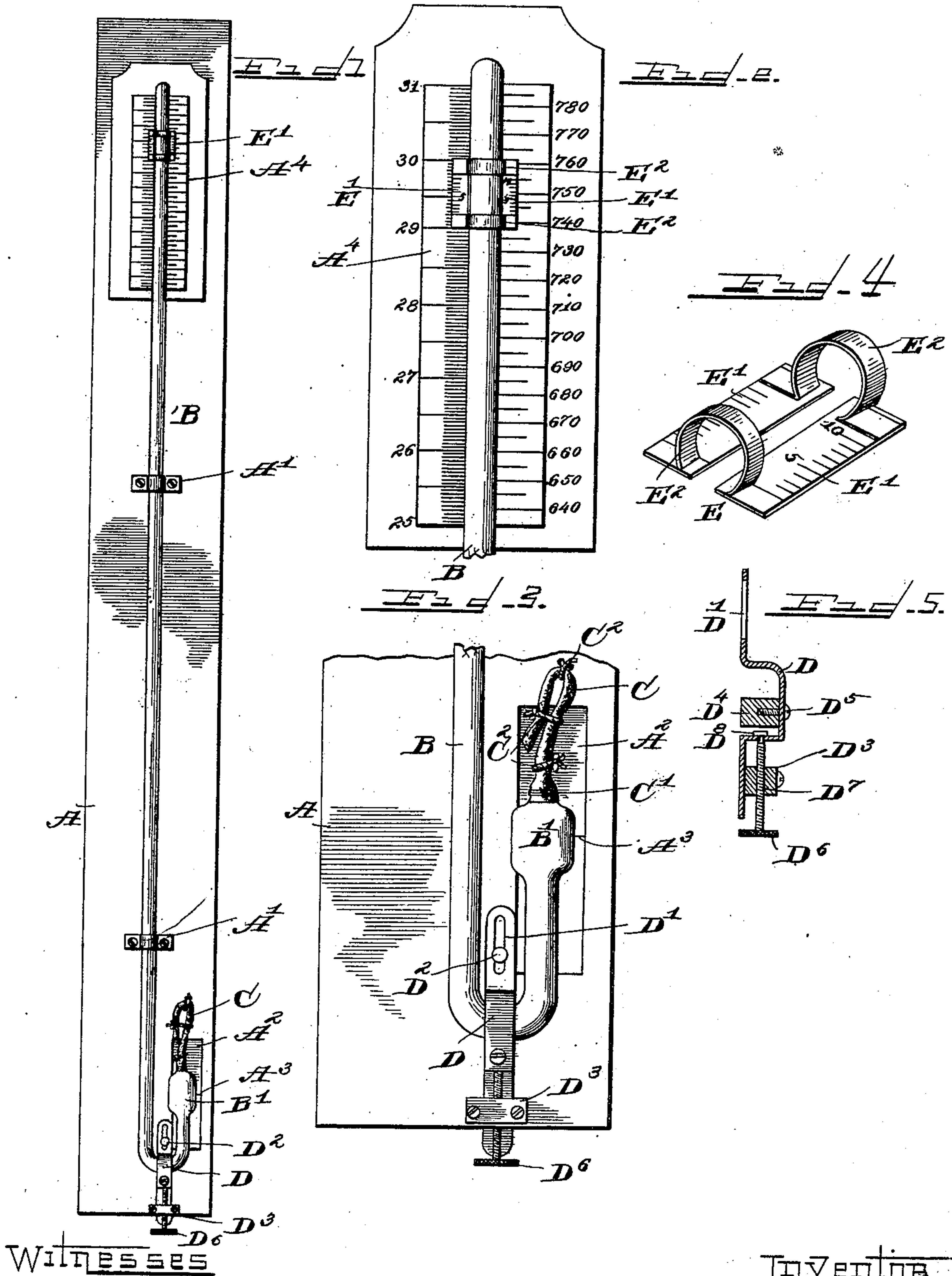
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A. L. ROBBINS.

BAROMETER.

(Application filed Sept. 30, 1901.)

(No Model.)



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## BAROMETER.

SPECIFICATION forming part of Letters Patent No. 706,112, dated August 5, 1902.

Application filed September 30, 1901. Serial No. 77,043. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED L. ROBBINS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Barometers, of which the following is a specification.

The object of this invention is the improvement and simplification of barometers.

10 In the accompanying drawings, Figure 1 is a front elevation of a barometer embodying the features of my invention. Fig. 2 is a view of the upper end of the tube for containing the mercurial column, also showing the scales and the vernier for use in connection therewith. Fig. 3 is an enlarged face view of the lower end of the instrument, showing the means for vertically adjusting the barometric tube, also showing the closure for the cistern, 20 which closure is intended to be applied in the transportation of the instrument. Fig. 4 is a perspective view of the vernier, and Fig. 5 a vertical central section through the adjusting means shown in Figs. 1 and 3 for bodily adjusting the barometer-tube vertically.

Like letters of reference indicate corresponding parts throughout the several views.

A is a rigid frame or base for the instrument, having the loops A' for holding the vertical portion of the barometric tube in position upon said base. At one side of the base A and near the bottom thereof is a small mirror A<sup>2</sup>, let into the surface of the base A and provided with a transverse line or mark 35 A<sup>3</sup>, called the "zero-line." At the upper end of the base A, on the face thereof, I secure a scale A<sup>4</sup>, of aluminium or other suitable material, divided on one side into inches and tenths and upon the other side into millimeters, the scale of inches beginning at "25" and running to "31," inclusive, and the millimeters beginning at "640" and running to "780," inclusive.

45 Within the loops A' and upon the face of the base A, I mount the tube B, curved upward in its short leg and being there provided with the cistern B'. The upper end of the long leg of the tube is closed, while the upper end of the short leg is open. The tube is 50 filled with mercury in the usual manner.

Great care has necessarily been exercised

in transporting barometers. The weight of the mercurial column is so great that even slight shocks and jars were likely to cause breaks or separations in the mercury in the tube B. To guard against this, I have provided an elastic closure for the open upper end of the cistern. This elastic cap in this instance is composed of a rubber tube C, secured over the mouth of the upper end of the cistern B' by the thread or cord C' and at several points in its length tied together with the threads C<sup>2</sup>. The rubber of the cap gives sufficient elasticity to permit of the expansion of the mercury in the column and also to take up the jars to which the mercury is subjected.

In use the mercury within the cistern B' should stand on a level with the zero-line A<sup>3</sup> in the mirror A<sup>2</sup>, and to provide for expansion and contraction and the consequent rising and falling of the surface-line of the mercury in the cistern B', I provide an adjusting means for bodily raising and lowering the tube B and the mercurial column therein contained. This means comprises the bracket 75 D, provided with the slotted opening D' near its upper end for the reception of the securing-screw D<sup>2</sup> and with the clip D<sup>3</sup> near its lower end, through which clip the bracket is free to slide vertically. A block D<sup>4</sup> is secured 80 by the screw D<sup>5</sup> to the bracket D and forms a part thereof, the upper side of said block providing a shoulder upon which the tube B rests. A thumb-screw D<sup>6</sup> extends through a screw-threaded opening D<sup>7</sup> in the clip D<sup>3</sup> and 85 at its upper end is reduced in diameter to extend through a small opening in the bracket D and is provided with the enlarged end D<sup>8</sup> to prevent its withdrawal from engagement with said bracket. From the foregoing description it will be seen that by turning the thumb-screw D<sup>6</sup> the barometric tube B may be bodily adjusted, said tube sliding vertically within the loops A'.

E is a vernier comprising two vernier-scales E', joined together near their ends by the two loops E<sup>2</sup>, preferably of spring material. These loops frictionally engage the tube B when the vernier is in position and permit of its movement upon the tube with reference to the scales A<sup>4</sup>.

When it is desirable to transport the in-



strument or at any time when the instrument is likely to be subjected to severe vibration or sudden jars, the tube C is placed upon the neck at the top of the cistern B' and secured in position by means of the cord C', tightly tied about the tube. Mercury is then poured through the tube until the cistern is filled and the mercury rises a little way into the tube C. The several bands C<sup>2</sup> are then tied about the tube C to close its open end. The expansion and contraction of the mercurial column are taken up by the elasticity of the rubber composing the tube C, and the shocks and jars which the barometric column receives are also absorbed in the same way.

I claim as my invention—

1. In a barometer, in combination, a tube; a barometric column in said tube; a bracket having a shoulder for supporting said tube, also having an elongated opening in its upper end; a clip adapted to guide said bracket; and a thumb-screw extending through a threaded opening in said clip for engaging said bracket to bodily raise and lower said tube to provide for the expansion and contraction of said column.

2. In a barometer, in combination, a base; a barometric tube bent to form a long and a short leg, said short leg being provided with a cistern having an open upper end; a mercurial column in said tube; loops on said base for slidably supporting the long leg of said tube; a mirror secured to said base behind said cistern, said mirror having a zero-mark; a bracket for supporting said tube at the point of juncture of its legs; and a screw for moving said bracket to adjust said column with reference to said zero-mark.

3. In a barometer, in combination, a barometric tube; an integral cistern having an open upper end, said cistern communicating at its lower end with one end of said tube and being formed integral with said tube; a barometric column in said tube; and a closure for said cistern, comprising a portion adapted to tightly engage the open upper end of said cistern, and a body portion composed of elas-

tic material adapted to contain a quantity of mercury.

4. In a barometer, in combination, a barometric tube bent to form a long and a short leg, said short leg being provided with a cistern formed integral therewith, said cistern having an open upper end; a mercurial column in said tube; and a closure for said cistern, comprising an elastic tube adapted to contain a quantity of mercury, and to be secured by one of its ends to the upper end of said cistern.

5. In a barometer, in combination, a barometric tube having a cistern at its open end formed integral with said tube; a barometric column in said tube; an elastic closure for said cistern adapted to be secured over the open end thereof; and means for bodily adjusting the barometric tube to provide for the expansion and contraction of said barometric column.

6. In a barometer, in combination, a barometric tube having a cistern at its open end formed integral with said tube; a barometric column in said tube; an elastic closure for said cistern adapted to be secured over the open end thereof; a bracket for supporting said tube; and means for moving said bracket in a vertical direction to provide for the expansion and contraction of said column.

7. A vernier for barometers, having two scales for different systems of lineal measurement, and a spring for holding said scales in frictional engagement with a portion of the barometer upon which it is mounted.

8. A vernier for barometers, having two scales for different systems of lineal measurement, and two loops for holding said scales together and for engaging the barometric tube for frictionally holding said vernier in engagement with a portion of the barometer upon which it is mounted.

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Witnesses:

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