

L. WOODRUFF.  
MERCURIAL BAROMETER.

No. 28,626.

Patented June 5, 1860.

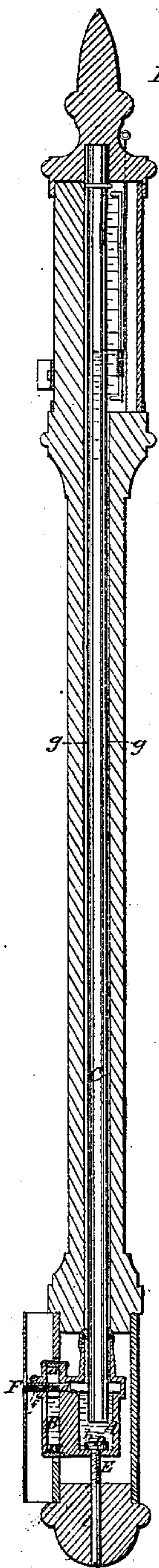


Fig. 1.

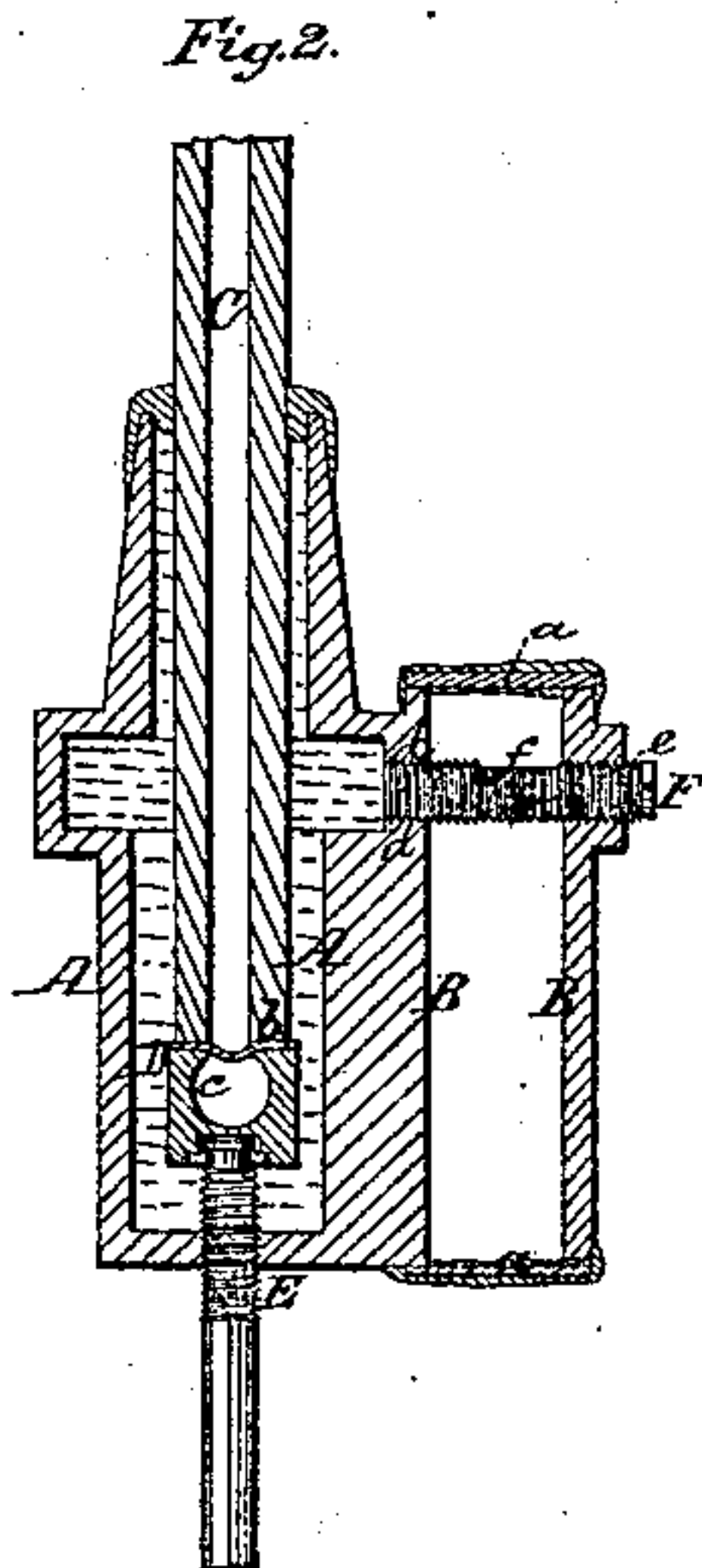


Fig. 2.

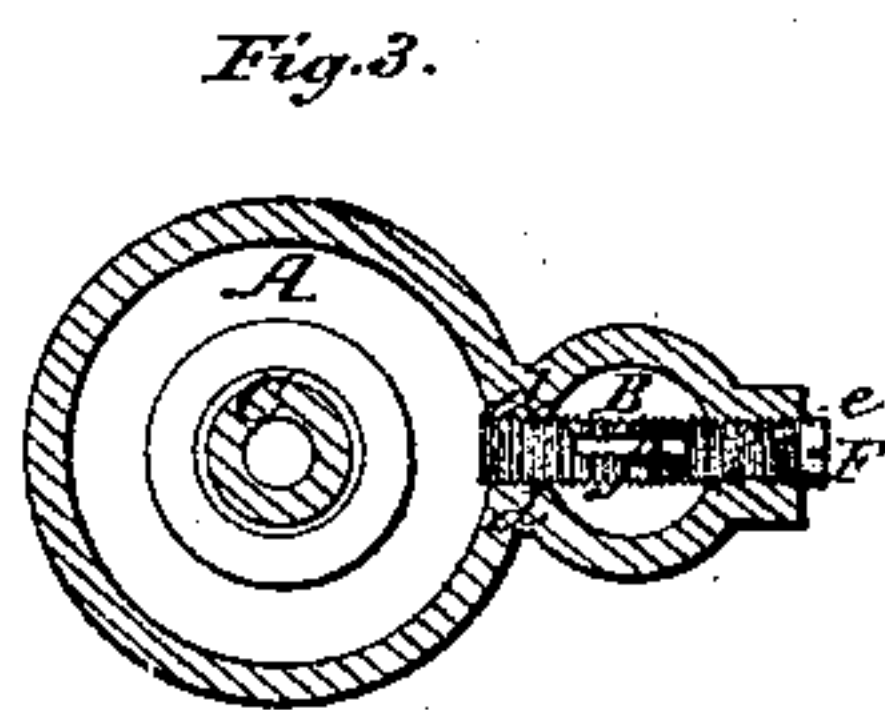


Fig. 3.

Witnesses.  
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# UNITED STATES PATENT OFFICE.

L. WOODRUFF, OF ANN ARBOR, MICHIGAN.

## BAROMETER.

Specification of Letters Patent No. 28,626, dated June 5, 1860.

*To all whom it may concern:*

Be it known that I, LUM WOODRUFF, of Ann Arbor, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in Mercurial Barometers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central vertical section of a barometer with my improvements. Fig. 2 is a vertical section of the cisterns on a larger scale than Fig. 1. Fig. 3 is a horizontal section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A, is the cistern, and B, the reservoir made of cast iron in one piece, the cistern having an opening at the top, and a closed bottom and the reservoir being made open throughout, and closed at top and bottom by stoppers *a, a*, made air tight with cement. C, is the tube cemented into the cistern, and dipping to within a short distance of the bottom thereof.

D, is the valve for closing the lower end of the tube, attached loosely to the upper end of an upright screw E, which screws through a tapped opening in the bottom of the cistern. This valve is faced with a piece of stout india-rubber or other flexible and elastic substance *b*, to prevent its injuring the tube, and to enable it to make a tight joint with the bottom thereof, and at the back of this rubber a cavity *c*, is formed in the valve to allow the rubber to yield to any expansion of the mercury that may take place when the tube is filled and the valve closed, and thereby to prevent the bursting of the tube. I will here remark, however, that before letting the mercury fill the tube and shutting it in, the instrument should be placed where the temperature is from 80° to 90° F., and in that case there will be little danger of subsequent expansion.

F, is the screw plug for closing the orifice of communication *d*, between the cistern and the reservoir, said plug screwing through a

tapped hole *e*, in the back of the reservoir opposite to the orifice *d*, which is tapped with a taper tap so that the plug may screw into it very tightly. When the plug is screwed up into the orifice *d*, it also fits closely into the hole *e*, but when it is unscrewed from *d*, a flat place or recess *f*, which is filed or cut in one side of it is brought into the hole *e*, forming a passage for the admission of air to the reservoir from which it passes through the orifice *d*, into the cistern A. The lower edge of the orifice *d*, is at the required level of the mercury in the cistern, and all the surplus mercury runs through the said orifice into the reservoir. The cistern A, and the whole of the tube C, except the indicating portion, are inclosed within a tubular casing G, of wood or other material, the inclosed portion of the tube being wound around with paper, cloth, or other soft material *g*, (Fig. 1) to form a packing filling the space between it and the casing, and thereby being protected from breakage.

To bring this barometer from the operative condition, shown in Fig. 1, to the portable condition, illustrated in Fig. 2, it is first placed horizontally with the reservoir B, upward and then shaken or jarred to make enough of the mercury from the cistern A, run into the tube C, to fill it, and the spare mercury from the reservoir B, run into the cistern to fill that completely. The screw plug F, is then screwed in tightly and the screw E, afterward screwed in to close the bottom of the tube C, by the valve D, and this being done it may be carried in any position, and will bear any amount of jarring or throwing about that it is likely to receive in transportation, without injury.

To bring it from the portable to the operative condition, it is first placed upside down, and while in this position the screw E, is unscrewed to open the valve D, and the barometer is jarred and shaken for a time to expel from the tube into the cistern any small quantity of air that may have accidentally entered the tube in packing for transportation. It is then hung up, and the plug F, unscrewed to let the surplus mercury out of the cistern into the reservoir.

I do not claim the reservoir for contain-



ing mercury to fill up the cistern; nor yet the use of a valve or cock to close the communication between the reservoir and cistern. But

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

The screw plug constructed and applied

to the reservoir and cistern, substantially as herein described, and operating as herein set forth.

LUM WOODRUFF.

Witnesses:

GEORGE C. MAYNARD,  
W. E. FRASER.