

No. 769,474.

PATENTED SEPT. 6, 1904.

W. F. FRUEHAUF.
THERMOMETER.

APPLICATION FILED NOV. 9, 1903.

NO MODEL.

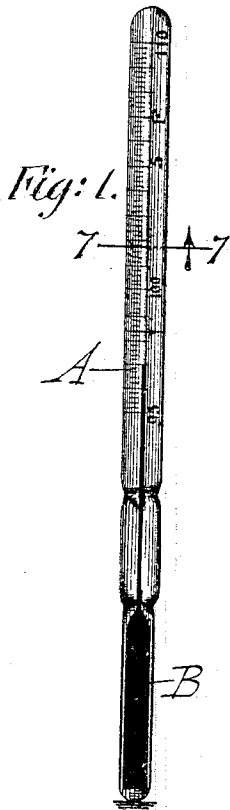


Fig: 7.



Fig: 3.

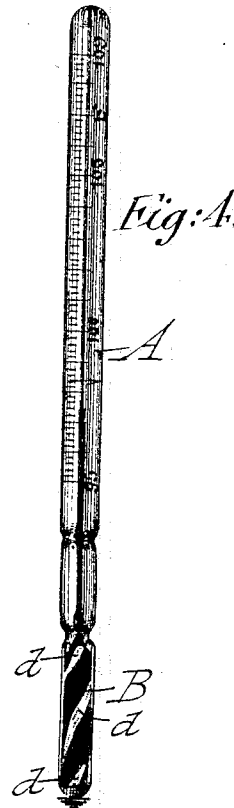
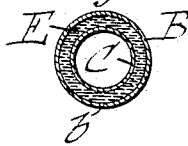


Fig: 2.

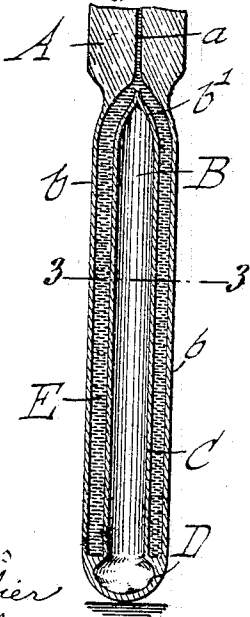


Fig: 5.

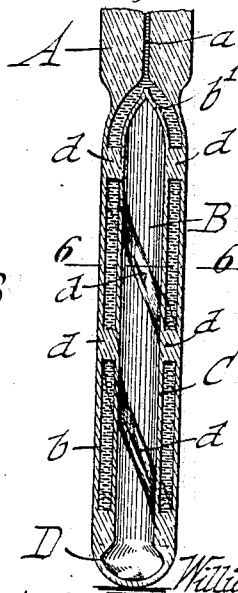


Fig: 6.



Witnesses
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THERMOMETER.

SPECIFICATION forming part of Letters Patent No. 769,474, dated September 6, 1904.

Application filed November 9, 1903. Serial No 180,384. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. FRUEHAUF, a citizen of the United States, residing in New York, borough of Brooklyn, in the State of New York, have invented certain new and useful Improvements in Thermometers, of which the following is a specification.

This invention relates to thermometers, and more especially to clinical thermometers; and the object of the invention is to provide a quick-acting thermometer of this type.

For this purpose the invention consists of a clinical thermometer, comprising a suitable thermometer-tube and a bulb at the lower end of said tube.

In the accompanying drawings, Figure 1 is an elevation of a thermometer embodying my invention. Fig. 2 is a vertical central section through the bulb and a portion of the tube. Fig. 3 is a horizontal section on line 3 3, Fig. 2. Fig. 4 is an elevation of a modified form of thermometer embodying my invention. Fig. 5 is a vertical central section through the bulb and a portion of the tube of said modified form of thermometer. Fig. 6 is a horizontal section on line 6 6, Fig. 5, and Fig. 7 is a horizontal section on line 7 7, Fig. 1, across the thermometer-tube.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A indicates the thermometer-tube, which is of the usual or any suitable cross-section—for example, that indicated in Fig. 7. At one end of the tube and communicating therewith is arranged the bulb B. Within said bulb is located a hollow core C. The core C and walls *b* of the bulb B are connected at the bottom. The walls of the bulb are extended beyond the core-walls, and rounded and closed, as shown at D, so as to close the lower end of the core. Between the core C and the exterior walls *b* of the bulb is the mercury-chamber of the bulb, in which the mercury E is contained. The core C retains the mercury in the form of a thin layer adjacent the walls of the bulb. The walls *b* preferably taper at their upper ends, as shown, to the bore *a* of the tube. The core C is closed from the mercury-chamber.

It is preferably made conical at its upper end *b'*, in conformity with the contraction of the walls *b*, and arranged in line with said bore.

It is obvious that the invention may be embodied in other than clinical thermometers, and in clinical and other thermometers having a different shape of bulb than that shown.

In order to increase the strength of the bulb, spirally-arranged partitions may be located between the core C and the bulb-walls *b*, as indicated in Fig. 5. These partition-walls *d* preferably extend from the bottom of the mercury-chamber of the bulb spirally through the same to nearly the top of said chamber, where they terminate.

A clinical thermometer, such as either of the forms shown, embodying my invention is employed by placing the bulb of the same beneath the tongue of the patient or at any other desired point. The mercury in the bulb B rapidly expands and rises in the tube until, when it ceases to further expand, the temperature is indicated by the position of the upper end of the mercury in the bore *a* against the scale upon the tube. The mercury rises with much greater rapidity than in a clinical thermometer of the ordinary type having a bulb containing a solid body of mercury. It is found that when approximately the proportions indicated in Fig. 2 are followed the mercury rises in about one-third the time required for a solid mercury-bulb of the corresponding size. Owing to the more rapid action the bulb may be made larger than in a clinical thermometer of the ordinary type and more mercury employed, whereby the weight is increased and the shaking down of the mercury into the bulb after operation rendered easier and more rapid. The use of the larger quantity of mercury enables also the employment of a thermometer-tube having a larger bore, so that with the lens usually employed the reading of the thermometer is rendered easy. It is possible thus to use a tube of the size heretofore commonly used for a "three-minute" thermometer in a thermometer made according to my invention, which will operate in one minute, so that the ease of reading of a three-minute thermometer is obtained in a ther-

mometer which operates in one third that time. The strength of the bulb is increased over that of an ordinary bulb by means of the core C and by the partitions between the same and
5 the bulb-walls.

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

1. A clinical thermometer, consisting of a
10 tube, a bulb, and a core connected at its lower end with the bulb and extending longitudinally therein, and closed at its upper end within said bulb, and closed at its lower end by

the lower end wall of the bulb, substantially as set forth.

2. A clinical thermometer, consisting of a
15 tube, a bulb, and a hollow closed core within said bulb, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

WILLIAM F. FRUEHAUF.

Witnesses:

HENRY J. SUHRBIER,
FRANK E. BOYCE.