

(No Model.)

D. BAKER.  
PYROMETER.

No. 602,613.

Patented Apr. 19, 1898.

Fig. 1.  
On line b-b

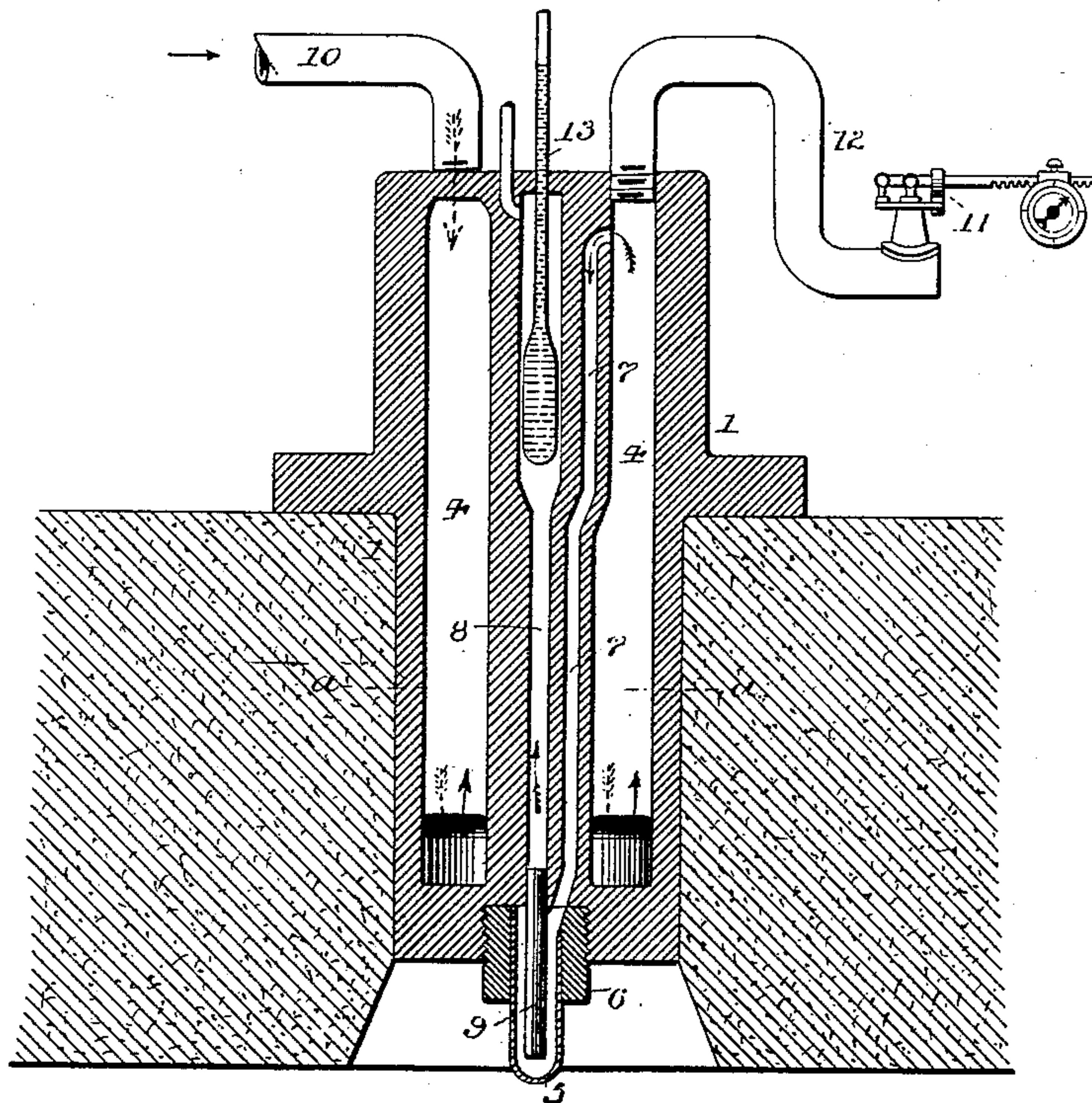
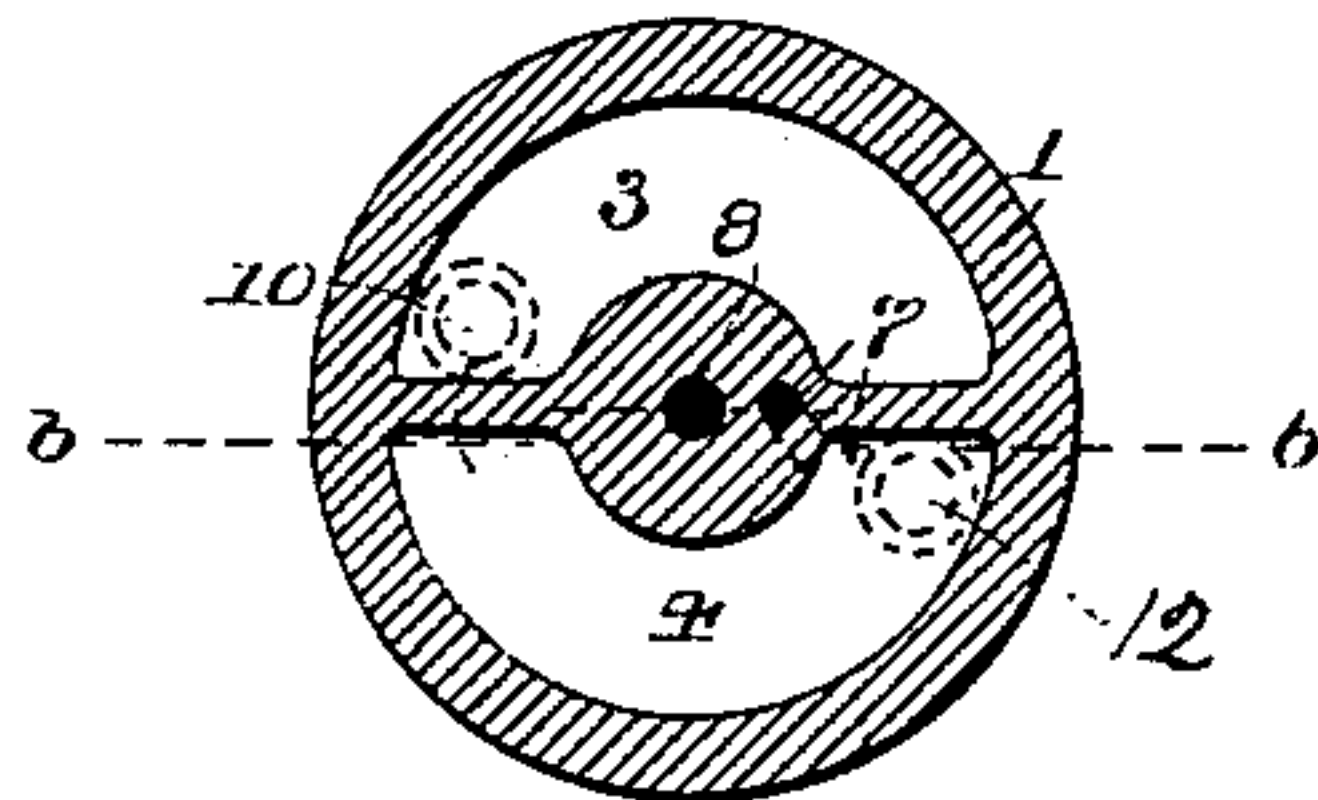


Fig. 2.  
On line a-a



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## PYROMETER.

SPECIFICATION forming part of Letters Patent No. 602,613, dated April 19, 1898.

Application filed January 7, 1897. Serial No. 618,244. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID BAKER, of Sparrow's Point, county of Baltimore, and State of Maryland, have invented a new and useful  
5 Improvement in Methods of Measuring Temperatures, of which the following is a specification.

This invention has reference to a method of measuring very high temperatures, such as  
10 exist in ovens, gas-flues, furnaces, &c.; and the invention consists, primarily, in passing saturated steam under a uniform pressure and temperature through a chamber exposed to the influence of the heat to be measured and  
15 in determining the temperature of the steam after its passage through this chamber.

In the accompanying drawings, Figure 1 is a longitudinal section through my improved pyrometer in the form I prefer to adopt, the  
20 same being shown as applied through the fire-bricks of a furnace for measuring the temperature within the same. Fig. 2 is a transverse section through the same on the line *a a*.

Referring to the drawings, the apparatus  
25 which I prefer to employ in carrying out my method is formed of a casting or casing 1, which is shown as extended in the wall of a furnace, with its inner end exposed to the influence of the heat within the furnace. This  
30 casting has formed in it two longitudinally-extending semicircular chambers 3 and 4, which communicate at their inner ends, as plainly shown in Fig. 1.

5 represents a capsule or bulb, of platinum  
35 or analogous material, fixed to a nut or head 6, tapped in the inner end of the casting and forming a chamber which is exposed to the heat within the furnace. The interior of this chamber communicates with chamber 4 by  
40 means of a passage 7, extending longitudinally in the central portion of the casting from the upper end of the chamber 4 to the interior of the bulb. The interior of the bulb also communicates with the external air by  
45 means of a second passage 8, extending longitudinally along the central portion of the casting parallel to the passage 7, the lower end of this passage 8 being provided with a  
50 tube 9, which extends into the bulb. By the passages and chambers described steam introduced into chamber 3 will pass from the inner end of the same to the chamber 4, thence

outward, leaving the same near its outer end by the passage 7, through which it will enter the bulb 5. The steam will leave the bulb  
55 through the pipe 9 and passage 8 and pass to the external air at the outer end of the casting.

In order to utilize this apparatus for measuring the temperature within the furnace, 60 steam is introduced from any suitable source into an entrance-pipe 10, communicating with chamber 3, and is maintained at uniform pressure and temperature by a pressure-regulator 11, which is applied to a pipe 12, communicating with the upper end of the chamber 4. The steam in its passage through the  
65 apparatus is exposed while in the bulb 5 to the influence of the heat within the furnace, and its temperature after leaving the bulb and while in the exit-passage 8 is measured  
70 by means of a thermometer 13 having its bulb inserted in this passage. The temperature of the interior of the furnace in which the bulb is exposed may by this means be computed by the comparative temperature of the  
75 steam when it enters the apparatus and its temperature as indicated by the thermometer in the exit-passage, the computation being based on results obtained by previous  
80 experiments with an apparatus in a furnace in which the temperature is known or is measured by other means.

The use of steam as the medium for determining the interior temperature by passing  
85 it through a chamber exposed to the influence of this temperature possesses advantages not attainable by the use of other fluids, mainly on account of the ability to maintain the steam at a uniform pressure, and consequently at a uniform temperature, on its  
90 entrance, and, further, the steam carrying no solid matters, there will be no liability of the passages in the apparatus becoming clogged by sediment.

I am aware that water has been passed  
95 through a chamber exposed to the influence of the heat to be measured, and its temperature thereafter determined, and I am also aware that air has been subjected to the  
100 action of the heat to be measured and the tension of the incoming and outgoing air compared to determine the interior temperature; but I believe myself to be the first to subject

steam at an unvarying temperature and uniform pressure in a chamber exposed to the influence of the heat to be measured and to determine the temperature of the steam after  
5 being thus exposed, and to such I lay broad claim without regard to the particular form of the apparatus for accomplishing the same.

Having thus described my invention, what I claim is—

10 The method of measuring high degrees of heat which consists in passing a current of saturated steam through a chamber exposed to the influence of the heat, thereby super-

heating said steam, maintaining said current at a uniform, unvarying pressure and temperature before it is superheated and determining the temperature of the superheated steam.

In testimony whereof I hereunto set my hand, this 6th day of January, 1896, in the presence of two attesting witnesses.

DAVID BAKER.

Witnesses:

JOHN F. PARKER,  
JAS. D. WOODRUFF.