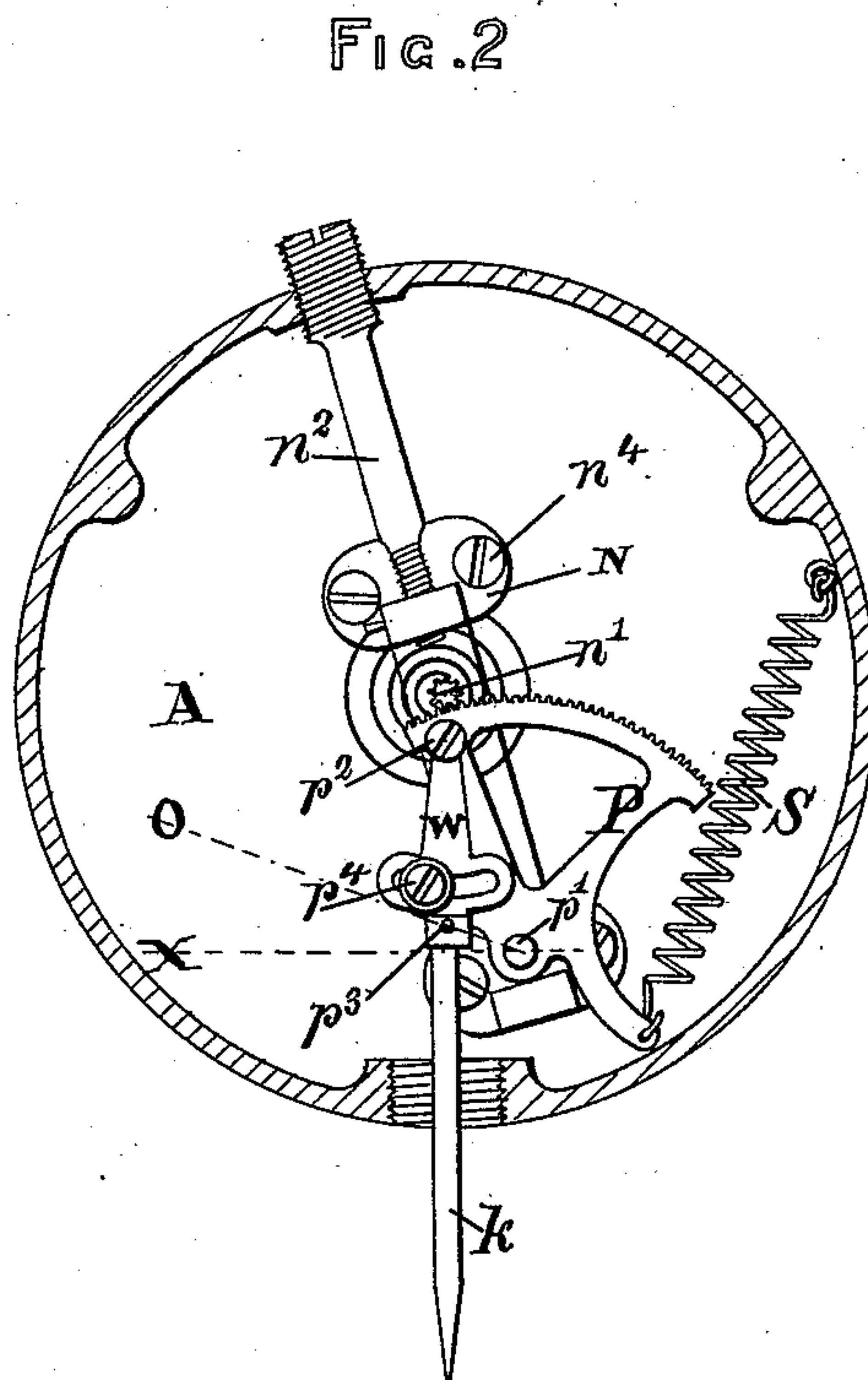
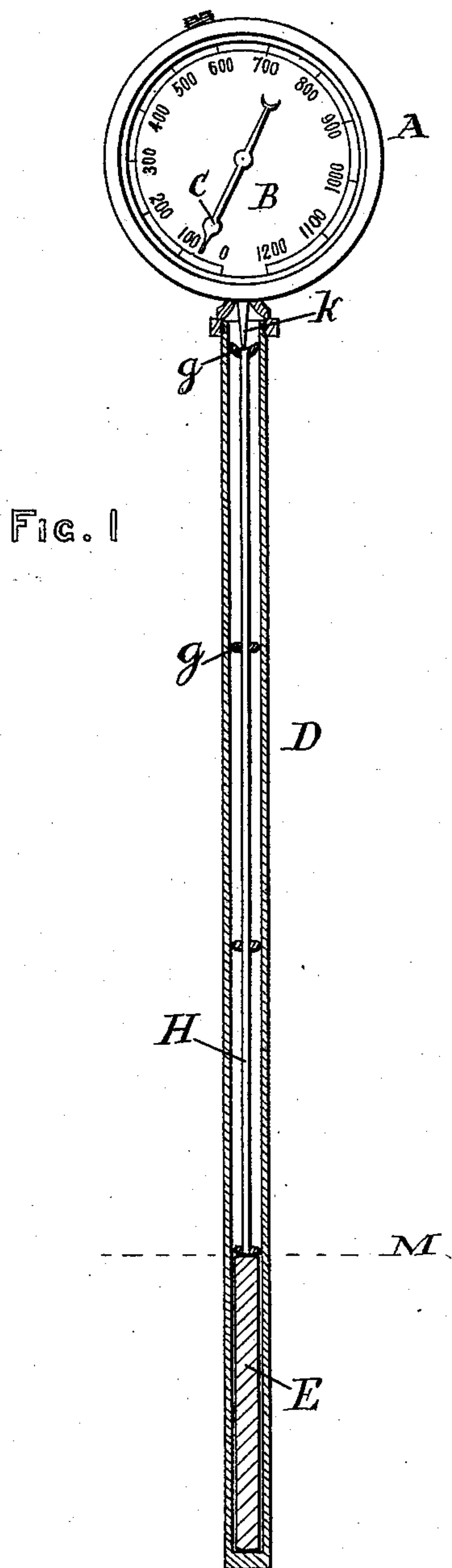


(No Model.)

E. BROWN.
PYROMETER.

No. 393,962.

Patented Dec. 4, 1888.



Witnesses.

John F. Grant.
Edward M. Echell.

Inventor.

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UNITED STATES PATENT OFFICE.

EDWARD BROWN, OF PHILADELPHIA, PENNSYLVANIA.

PYROMETER.

SPECIFICATION forming part of Letters Patent No. 393,962, dated December 4, 1888.

Application filed March 16, 1888. Serial No. 267,414. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BROWN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Pyrometer, of which the following is a specification.

My invention relates to the construction of pyrometers which have a long stem projecting into the medium, the temperature of which is to be indicated, which stem is secured to a case containing the multiplying mechanism, pointer, and dial.

The object of my invention is to so construct the stem that the part of it where the difference in expansion takes place may be easily proportioned to any length necessary to suit each particular situation, and that the sliding pieces of the stem shall offer very little frictional resistance to the light mechanism contained in the case; also, to facilitate the adjustment of the pyrometer by hinging the adjusting-arm to the toothed quadrant so that the radius of the lever which controls the movement of the pointer may be lengthened or shortened without materially altering the position of the hand upon the dial or disturbing the equidistant throw of the lever above and below the horizontal line.

In the accompanying drawings, Figure 1 is a vertical section through the pyrometer-stem. Fig. 2 is an elevation showing the mechanism in the case or head of the pyrometer.

Similar letters refer to similar parts.

In Fig. 1 is seen the case or head A, having a dial, B, and a pointer, C, which is actuated by the difference in expansion in the parts of the stem. This stem has an exterior tube, D, of iron or other metal, closed at the bottom, upon which rests a bar of plumbago ware, E, or other material, which expands much less per degree of heat than the tube D. A horizontal line, M, is drawn from the top of the plumbago bar. Upon the bar E rests a light rod, H, about three-sixteenths of an inch in diameter, of similar material, or material having a similar rate of expansion to the outside tube, D. Upon this light rod I drive buttons *g* to steady the rod in the center of the tube. The tube D is secured rigidly

to the head A. Any difference in expansion between the tube and bar E is thus communicated by the rod H and link *k* to the pointer by means of suitable mechanism in the case A. 55

A common use for which pyrometers are required is to indicate the temperature inside an oven or muffle where a considerable thickness of brick-work intervenes; also, to indicate the temperature at the bottom of an asphaltum-still several feet from the surface. By the means above described the part of the stem below the line M, and that portion above the line M which has no influence on the pointer, can easily be adjusted to the exact proportions. 65

The interior rod, H, is readily altered to any length, and when four or five feet long is so light as to offer very little frictional resistance to the spring S, which holds all the parts in contact when the instrument is laid upon its side or is upside down. 70

In the case or head A is seen the multiplying mechanism which actuates the pointer C. This consists of a frame, N, secured by screws n^4 to the case. n^2 is a differential adjusting-screw. One end of it passes through the case, the other through the frame N. The screws n^4 pass through elongated slots in the frame N, and by turning the screw n^2 a small vertical movement is given to the frame N. Within the frame N is mounted the toothed quadrant P on a pivot, p' . The spring S is hooked to an arm of the quadrant P at one end and to the case A at the other end. A small pinion, n' , which carries the pointer C, gears into the quadrant. At one end of the quadrant P is hinged the adjusting-arm W by means of the screw-pin p^2 . The other end carries a pin, p^3 , by which it is jointed to the connecting-link *k*. The arm W is also slotted near to the pin p^3 , and a set-screw, p^4 , passes through the said slot into the quadrant P and serves to fasten the arm W rigidly to the quadrant when the pin p^3 is at the exact radius required for each particular pyrometer. 85 90 95

A horizontal line, X p' , is shown passing through the center of the pivot p' . Another radial line, O p' , is shown, which passes through the pin p^3 , which pin is supposed to be at the top of its stroke when the pointer C is at the atmospheric temperature about 50°. 100

The spring S, acting on the quadrant P, is sufficient to force the link *k*, the rod H, and the bar E all in close contact with the bottom of the tube D when the instrument is on its side.

It will be observed that when the mechanism is in the position shown—as it is at atmospheric temperature and the quadrant at the extreme end of its throw—the adjusting-arm W and link *k* are in the same straight and vertical line, and a movement of the adjusting-arm W to lengthen or shorten the distance from p^3 to p' will not materially alter the relative position of the pinion n' upon the quadrant P. By this construction I am able to adjust the instruments much more quickly and secure greater accuracy.

I claim—

1. In pyrometers, the combination of the exterior tube, D, the non-expanding piece E, the sliding rod H, with buttons *g* fitted thereon, and the case A, containing the multiplying mechanism which communicates with the pointer C, substantially as described.

2. In pyrometer mechanism, the combination of the toothed quadrant P, the pinion n' , carrying the pointer, the adjusting-arm W, hinged to the quadrant P at a point just below the pointer-pinion n' , the quadrant being at one end of its throw, and the connecting-link *k*, as herein described.

3. In a pyrometer, the combination of a stem composed of two materials having a different rate of expansion, a sliding rod, H, and link *k*, communicating the expansion of the stem to the mechanism in the case A, the adjusting-arm W, hinged to the quadrant P at a point just below the pointer-pinion n' , when the quadrant is at one end of its throw, and the spring S, arranged to hold all the parts in contact, as described.

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Witnesses:

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