

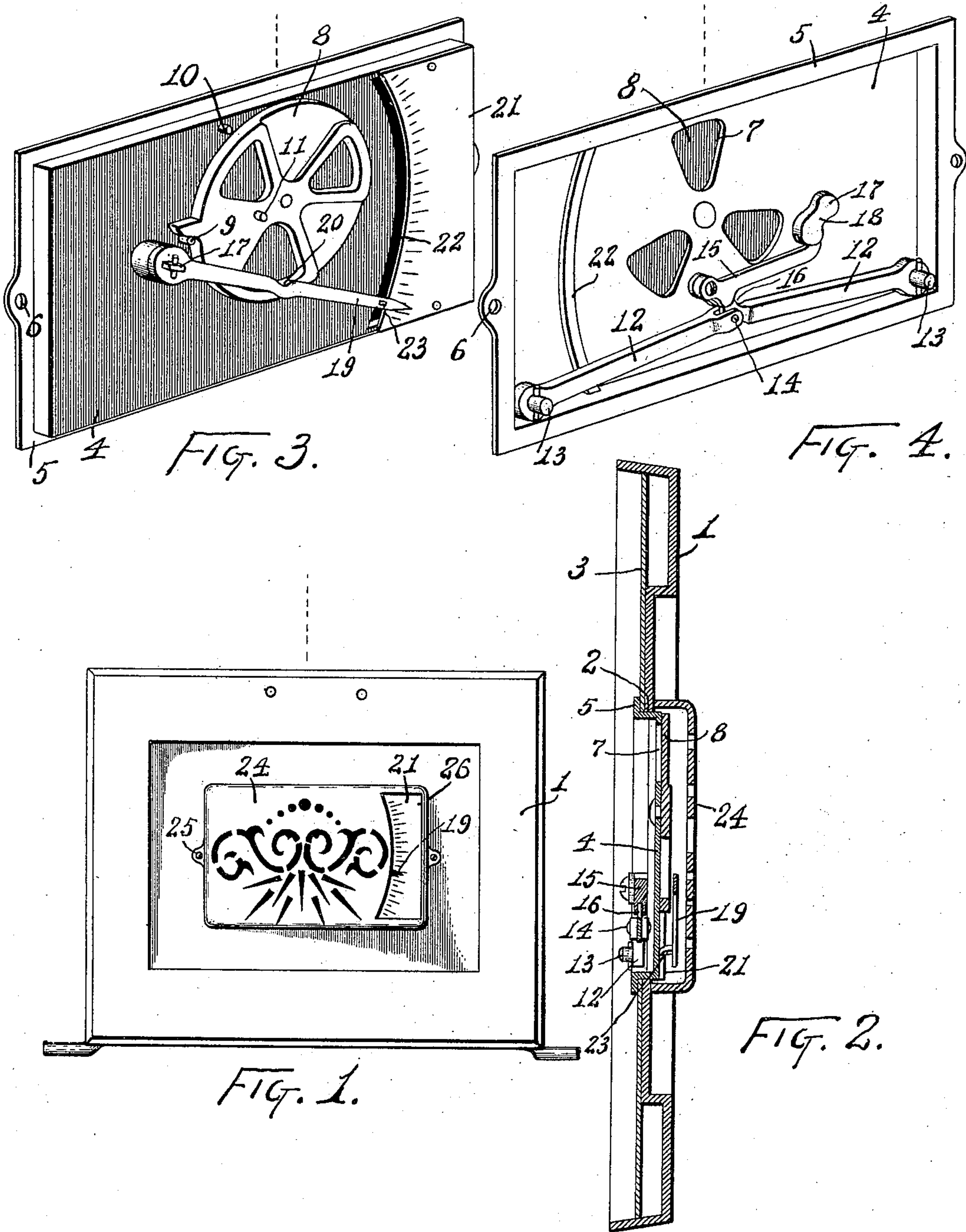
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L. DUEMER.
OVEN THERMOMETER.

(Application filed May 6, 1899.)

(No Model.)



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LOUIS DUEMER, OF HAMILTON, OHIO.

OVEN-THERMOMETER.

SPECIFICATION forming part of Letters Patent No. 641,280, dated January 16, 1900.

Application filed May 6, 1899. Serial No. 715,811. (No model.)

To all whom it may concern:

Be it known that I, LOUIS DUEMER, a citizen of the United States, and a resident of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Oven-Thermometers, of which the following is a specification.

This invention relates to improvements in thermometers for use in connection with the ovens of stoves, ranges, &c.; and the improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of the drop-door of an ordinary range provided with my improved thermometer; Fig. 2, a vertical section of the same; Fig. 3, a perspective front view of the thermometer detached from the door, and Fig. 4 a perspective rear view of the same.

In the drawings, 1 indicates an ordinary oven-door; 2, a mortise therethrough to receive the thermometer; 3, a lining-piece of bright tin lying against the inner face of the oven-door and having a mortise similar to the oven-door to admit the thermometer; 4, the body-plate of the thermometer of a size to fit the mortise in the oven-door and formed, preferably, of cast-iron; 5, a marginal flange projecting from the body-plate of the thermometer and adapted to engage to the rear of tin 3 and clamp the tin to the oven-door; 6, screw-holes in flange 5 registering with holes through the oven-door; 7, register-openings through the body-plate of the thermometer; 8, a circular register pivoted on the front of the body-plate of the thermometer and adapted by partial rotation to open and close the register-holes 7, this register being heavier upon one side than the other, so as to be unbalanced upon its pivot and tend to automatically turn to position of closure; 9, a stop-pin on the body-plate of the thermometer adapted to be engaged by a lug projecting from the register and serve in limiting the turning of the register to a position of closure; 10, a stop-pin to limit the turning of the register to open position; 11, an actuating-pin projecting from the register; 12, a pair of expansion-bars, preferably of brass, pivoted to-

gether and having their outer ends mounted loosely on pivots carried by the body-plate of the thermometer, these expansion-bars being mounted on the rear of the body-plate; 13, the end pivots of the expansion-bars; 14, the junction-pivot of the expansion-bars; 15, a lever with its heel loosely mounted on a pivot carried by the body-plate of the thermometer, this pivot being disposed above pivot 14 and to one side of the vertical plane thereof, so that pivot 14 comes below the body of lever 15 near its pivot; 16, a toe projecting upwardly from one of the expansion-bars 12 at the juncture of the two bars, this toe engaging the under surface of lever 15 near the pivot of lever 15; 17, a spindle journaled in the body-plate of the thermometer; 18, a short arm formed on the rear end of spindle 17 and projecting over and engaged by the outer end of lever 15; 19, a pointer fixed on the front end of spindle 17 and projecting along the front face of the body-plate of the thermometer in the direction toward the pivot of lever 15 and past the face of register 8 and adapted as the pointer rises to engage under actuating-pin 11 on the register; 20, a curved portion of the edge of pointer 19, adapted to be traversed by actuating-pin 11 of the register when the pointer has in rising nearly completed the opening motion of the register; 21, a graduated plate secured at one end of the face of the body-plate of the thermometer to the rear of the extremity of the pointer and bearing an arc of graduation; 22, an arc-shaped groove in the front face of the body-plate of the thermometer, the inner edge of graduated plate 21 projecting somewhat over the outer wall of this groove, so as to form a lip thereto; 23, a prong projecting rearwardly and outwardly from pointer 19 and engaging the rear of the lip thus formed by the graduated plate, this prong serving to prevent the outward displacement of the end of the pointer; 24, a mask-plate mounted against the front of the oven-door and covering the front of the thermometer, this mask-plate being perforated to permit access of the

external air to the front of the thermometer; 25, screws engaging through the holes 6 of the thermometer and through corresponding holes in the tin lining 3 and the oven-door and the mask-plate and serving to clamp the mask-plate and thermometer and tin lining to place on the oven-door, and 26 a port through the mask-plate exposing the arc of graduations on plate 21.

10 The thermometer is operated by the expansion of metal under the influence of heat. The body-plate is preferably of cast-iron or some other material which is comparatively unaffected by the heat, while the expansion-bars 12 are of a material having a high expansion rate, such as brass. The expansion-bars 12 are normally flexed slightly upward, and regardless of how loose they may be upon their pivots 13 their weight urges them downwardly into condition of compression. As the temperature of the parts arises it is obvious that the expansion-bars will partake of a superior increase in length, the result being an upward flexure of the bars and the elevation of toe 16. The rising of toe 16 causes the rising of the free end of bar 15 in a multiplied degree, and the rising of the free end of bar 15 produces the rising of the free end of arm 18 and the consequent rising of the extremity of the pointer along the arc of the graduations. The weight of lever 15 keeps it downward in contact with toe 16, and the weight of the pointer keeps arm 18 downward in contact with lever 15, a high multiplication of the motion due to expansion thus being obtained without the necessity for tight or accurate fitting of parts and without the need of springs. It is preferable that the free end of arm 18 where it engages the extremity of lever 15 and also that portion of lever 15 where it engages toe 16 be shrouded, so as to form slots to prevent front and rear displacement of the engaged parts, the engagement, however, being loose, so as not to impede freedom of motion. The expansion parts are subject to free access by the hot products within the oven, the thermometer being open at the rear. Mask-plate 24 protects the front of the thermometer and gives finish to the door. Prong 23 prevents improper transverse displacement of the extremity of the pointer as the oven-door is opened and closed and maintains proper relationship of parts during shipment.

55 The oven heat produces the expansion described, the measure highly multiplied of which may be read upon the graduated plate. The register is normally closed and held so by the weight of its heavier side. Within 60 reasonable range of motion the pointer is independent of the register; but in case the oven gets excessively hot the continued rising of the pointer will bring it into engagement with pin 11 and open the register, the 65 register closing itself as the pointer retreats under the influence of lowered temperature in the oven. When the pointer first engages

pin 11 and proceeds to open the register, the leverage represented by pin 11 is in advantageous condition, but as pin 11 rises it decreases in leverage effect and would call for more power on the part of the pointer. The curve 20 compensates for this by causing the pointer to act as a cam upon pin 11 in the more advanced portions of the pointer-stroke, the pin thus moving a less angular distance than that of the pointer. 70 75

It will be observed that the mask-plate, the body-plate, and the heat-reflector 3 are secured together and to the stove-door by two screws passed through all four parts. This arrangement lessens the labor of assembling the parts and reduces the cost. 80

The heat-reflector throws the heat back into the oven, except at such point as it should act on the thermometer. 85

The device employs loose joints and gravity-contacts throughout, so that it need not be highly finished and delicately adjusted. It is not liable to stick and thereby become inoperative under the rough usage to which stove-doors are invariably subjected, but to the contrary this rough usage and constant light hammering actually insures it against sticking and increases its efficiency. 90 95

I claim as my invention—

1. In an oven-thermometer, the combination, substantially as set forth, of a body-plate, a pair of pivots mounted thereon, a pair of bars pivoted together and having their outer extremities mounted on said pivots, the combined length of said bars being somewhat in excess of the distance between said pivots, a lever pivoted to said body-plate over and having an intermediate portion engaging the juncture of said bars, a spindle journaled in said body-plate, an arm fast directly on one end of said spindle and engaging the free end of said lever, a pointer on the other end of said spindle, an arc of graduations adapted to be traversed by said pointer, a self-closing register mounted on said body-plate, and a projection from said register adapted to be engaged by said pointer in the advanced portion of the travel of the pointer. 100 105 110 115

2. In an oven-thermometer, the combination, substantially as set forth, of a body-plate, a pair of pivots mounted thereon, a pair of bars pivoted together and having their outer extremities mounted on said pivots, the combined length of said bars being somewhat in excess of the distance between said pivots, a lever pivoted to said body-plate over and engaging the juncture of said bars, a spindle journaled in said body-plate, an arm on one end of said spindle engaging the free end of said lever, a pointer on the other end of said spindle and provided with a cam-shaped curve portion, an arc of graduations adapted to be traversed by said pointer, a self-closing register mounted on said body-plate, and a projection from said register adapted to be engaged by said pointer and traverse the cam-shaped portion thereof. 120 125 130

3. In an oven-thermometer the combination, substantially as set forth, of a body-plate, a pair of pivots mounted thereon, a pair of bars pivoted together and having
5 their outer extremities mounted on said pivots, the combined length of said bars being somewhat in excess of the distance between said pivots, a lever pivoted to said body-plate over and engaging the juncture of said bars, a
10 spindle journaled in said body-plate, an arm on one end of said spindle engaging the free end of said lever, a pointer on the other end of said spindle, a plate bearing an arc of graduations adapted to be traversed by said pointer
15 and disposed to the rear of the pointer, and a retaining-lip at the inner edge of said graduated plate and engaging forwardly of a por-

tion of a pointer to serve in restraining the outward movement of the pointer.

4. In an oven-thermometer, the combination of a vibratory pointer, means for vibrating said pointer as the heat in the oven varies, and a self-closing register having a pin projecting from its side in the path of the pointer and above the plane of the pivot of
20 the same whereby the ordinary travel of the pointer will not disturb the register but its extended travel under excessive heat will cause it to engage said pin and open the register.
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