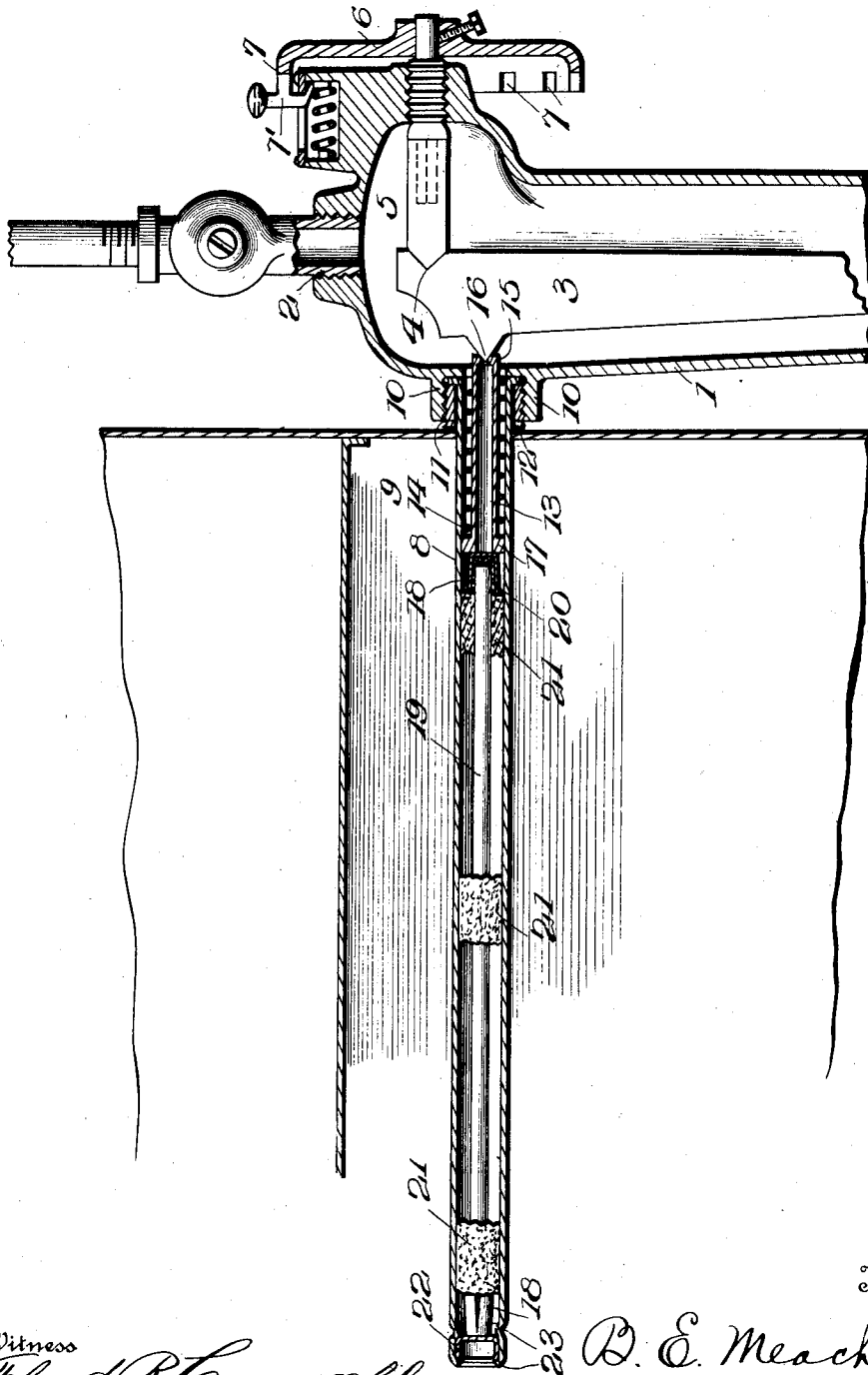


B. E. MEACHAM.
THERMOSTATIC TUBE AND CONNECTION THEREFOR.
APPLICATION FILED AUG. 26, 1918.

1,330,600.

Patented Feb. 10, 1920.



Witness
Moyd R. Cornwall
L. L. Burkett

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Inventor
B. E. Meacham
A. S. Pattison

Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN E. MEACHAM, OF LORAIN, OHIO, ASSIGNOR TO AMERICAN STOVE COMPANY,
OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

THERMOSTATIC TUBE AND CONNECTION THEREFOR.

1,330,600.

Specification of Letters Patent.

Patented Feb. 10, 1920.

Application filed August 26, 1918. Serial No. 251,533.

To all whom it may concern:

Be it known that I, BENJAMIN E. MEACHAM, a citizen of the United States, residing at Lorain, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Thermostatic Tubes and Connections Therefor, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in thermostatic tubes and connections therefor, and is especially intended for use in connection with a gas oven for the purpose of controlling the flow of gas to the oven burner and thereby controlling the heat therein to a predetermined degree.

The present improvement pertains to certain details of construction which will be hereinafter particularly pointed out, the objects of which will also be described in connection with the description of the specific constructions.

The accompanying drawing is a vertical sectional view of a thermostatic tube and connections embodying my present improvement, shown in connection with the immediate cooperating mechanism and extending into the stove oven.

The mechanism cooperating with my improvement in thermostatic tubes is shown in my Patent No. 1,236,335, dated August 7th, 1917. The cooperating mechanism embodies a housing 1, into which gas is admitted through a suitable pipe 2. Located within the housing 1, is a lever 3, having a fulcrum 4, on an adjustable shaft 5, the outer end of the shaft projecting outside of the housing and carrying a wheel 6. This wheel 6 is provided with suitable notches 7, into which a spring latch 7' is adapted to engage for locking the wheel at the desired adjustment.

My improved thermostatic tube 8 projects into the stove oven 9, to be affected by the heat therein, and the expansion and contraction thereof will operate the lever 3 as illustrated in my aforesaid patent.

In devices of the character here shown, they are adjusted at the factory, so that the indicator numbers on the wheel 6 (before mentioned) will accurately indicate to the operator the predetermined degree of heat that will be maintained within the oven. This adjustment must be done by skilled

persons, and it is necessary to the successful commercial use of a device of this character that the adjustment be not disturbed in its practical use and be so constructed that it is fixed.

My experience in the practical operation of the construction shown in my said patent, in the hands of the public, is that where the tube is threaded in the housing, it becomes loosened by the continual expansion and contraction and is readily thrown out of adjustment, so that the regulator will no longer operate in unison with the indications on the wheel 6, and thus make the device almost useless in the hands of the public.

I overcome this trouble in my present improvement by constructing the outer end of the expansion tube 8, with a lateral flange 10, and providing the housing with an internally screw-threaded socket 11, sufficiently large to receive the flange 10. I then lock the outer end of the expansion tube 8, within the socket 10, by an annular lock-nut 11. The expansion tube 8 is made of copper and is very susceptible to expansion and contraction, due to heat and cold, and for this reason experience has taught that it readily works loose when screw-threaded directly in the housing, as shown in my patent. The nut lock 11 is made of steel and is much less susceptible to contraction and expansion by heat and does not extend into the oven as does the tube, and is, therefore, not subjected to the heat to which the tube is subjected. I find from experience that this construction prevents the working loose of the connection of the inner end of the expansion tube 8 with the housing and makes a fixed tight joint between the expansion tube 8 and the housing 1. Again, this annular lock nut 11 cannot be tampered with except with a specially constructed wrench, which has a projection to engage a notch 12, formed in the projecting end of the lock-nut 11. When the parts are assembled, the extending ends of the lock-nut 11 and socket 10 are so close to the wall of the oven 9 that it cannot be operated except with a specially constructed wrench.

Another improvement in my present construction is providing a plunger 13, which is surrounded by a spring 14, and has its outer end 15 projecting into the housing 1, and engaging a conical projection 16 on the lever 3. The inner end of the plunger

13 has a head 17, which engages a cap 18 that is attached to the end of the porcelain rod 19, which is substantially non-expansible, by cement 20. By means of this cap and cement, the ends of the porcelain rod are protected and prevented from being chipped or broken, and the opposite end of the porcelain rod 19 has a similar cap 18, which is similarly cemented thereto, thus protecting the other end of the porcelain rod 19. These caps and cement prevent the ends of the rod being chipped or broken and maintain the rod in its proper length to operate with the other mechanism before described. It will be understood that any change in the length of the rod 19, due to any cause whatever, would throw out the adjustment of the device. These caps and cement secure the rod in its proper predetermined length so that its adjustment is in no wise affected by use.

For the purpose of protecting the porcelain rod 19 within the expansion tube 8, I provide it with a plurality of (preferably three) asbestos cushions 21, which surround the rod and maintain it in proper position within the expansion tube 8, and at the same time prevent it from being broken in transportation, or in any handling in the use of the device or oven to which it is attached.

A rigid support is provided for the inner end of the rod 19 through the medium of a cup-shaped closure 22, for the adjacent end of the expansion rod 18. This cup-shaped member 22 is held within the end of the tube 8 by the intermediate and end crimps 23. This manner of closing the end of the tube 8 prevents any necessity for brazing a plug into the end of the tube, for the same purpose as I have done heretofore. When the tube is closed by brazing, that end of the tube is annealed for three or four inches and the tube will stretch in continued use and effect adjustment of the device.

In operation, as the expansion tube 8 expands, due to the heat in the oven, the spring actuated plunger 13 moves inward along with the porcelain rod 19, as will be understood, thus permitting the lower end of the lever 3, to move inward, and when the tube 8 contracts by its cooling off, the spring plunger is pushed outward and

moves the lever 3 in the opposite direction. In this way the gas valve connected to the lower end of the lever, as shown in my aforesaid patent, is opened or closed by the outward and inward movement of the lever 3.

By means of the foregoing details of construction, I am able to maintain a fixed adjustment of the parts and to protect it in use.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A thermostatic control having a fixed connection for the purpose described comprising an oven, a housing located outside of and adjacent the oven, the inner side of the housing provided with a projecting internally screw-threaded socket, an expansion tube having its outer end provided with an outwardly projecting peripheral flange, a non-expansion member within the expansion tube, an externally screw threaded annular nut surrounding the expansion tube and having its end engaging the outer face of the expansion tube flange and clamping it tightly and preventing a change in the adjustment of the tube, and a lever operated through the actions of the expansion and non-expansion members, for the purpose described.

2. A thermostatic control for the purpose described comprising an oven, a housing outside of and adjacent the oven, an expansion tube within the oven and projecting through its wall and having its outer end connected to the housing, a non-expansible member within the tube, a lever within the housing having an adjustable fulcrum, a plunger separate from the non-expansible member within the outer end of the tube, a spring within the tube and surrounding the plunger and holding the inner end of the plunger in contact with the outer end of the non-expansible member, and the outer end of the plunger engaging the said lever, for the purpose described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

BENJAMIN E. MEACHAM.

Witnesses:

A. C. CALHOUN,
C. E. VAN DEUSEN.