(No Model.)

A. J. SIMPSON.

AUTOMATIC HEAT REGULATOR FOR COOKING VESSELS, &c.

No. 332,295. Patented Dec. 15, 1885.

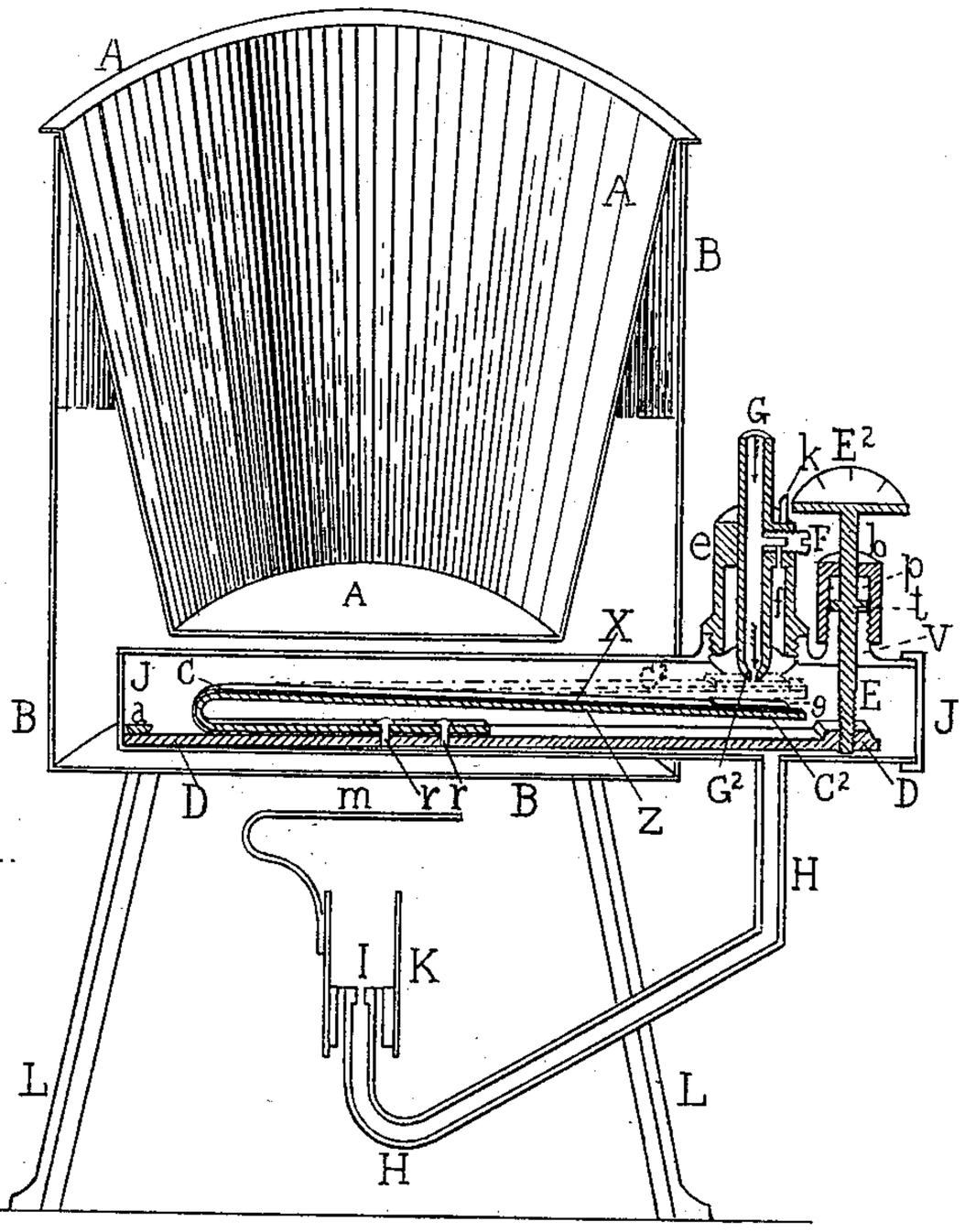

FIG. 1.

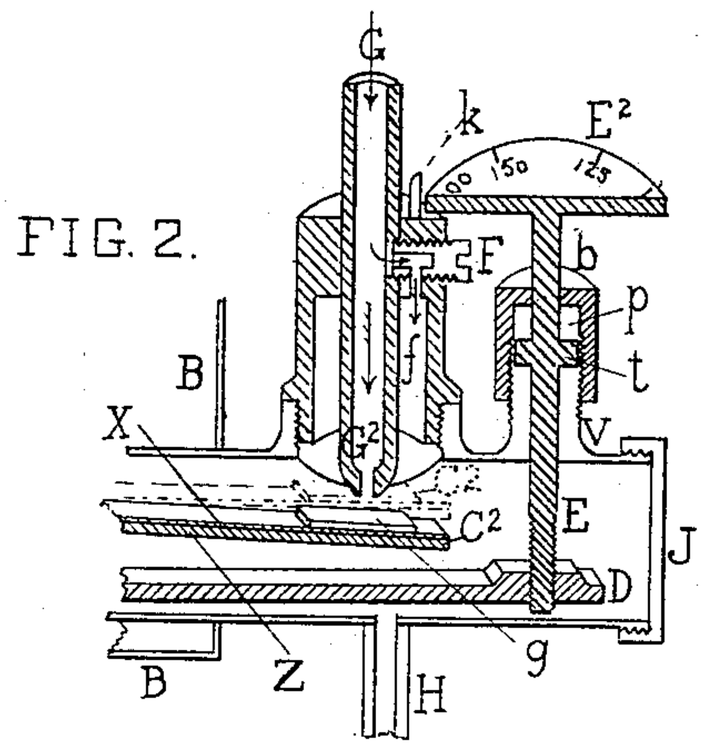

FIG. 2.

WITNESSES.

A. B. Plimpton

S. H. Cherrington

INVENTOR.

Andrew Jackson Simpson

by L. J. Cherrington

his attorney in fact

UNITED STATES PATENT OFFICE.

ANDREW JACKSON SIMPSON, OF LOWELL, MASSACHUSETTS.

AUTOMATIC HEAT-REGULATOR FOR COOKING-VESSELS, &c.

SPECIFICATION forming part of Letters Patent No. 332,295, dated December 15, 1885.

Application filed April 21, 1885. Serial No. 162,898. (No model.)

To all whom it may concern:

Be it known that I, ANDREW JACKSON SIMPSON, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Automatic Heat-Regulators for Cooking and Warming Vessels, of which the following is a specification.

My invention consists in combining, within a cooking or warming vessel, a chamber through which a supply of gas passes, and in arranging within said chamber an automatic gas cut-off operated by a compound bar or plate composed of laminæ of two different substances (preferably brass and steel) having different degrees of expansion when subjected to heat, and in so adjusting said cut-off as to regulate and control the supply of gas or gaseous fluid, and hence the amount of supplied heat, by the movement of said laminated bar through the action of the heat, the degree of heat desired being adjusted by an independent movement of the cut-off mechanism and indicated by a marked index.

The construction and operation of my invention are illustrated in the accompanying drawings, of which—

Figure 1 is a top perspective view of the several parts in vertical section of a cooking-vessel with the automatic heat-regulator in connection with mechanism for supplying the heating-gas. Fig. 2 is an enlarged similar view of the gas-inlet tube in combination with one end of the chamber containing the cut-off, together with the end of the laminated cut-off bar and the pipe which conveys gas to the burning-orifice under the vessel.

Similar letters refer to similar parts in each drawing, as follows, viz:

A A A is an inner vessel, and B B B is the outer vessel, of a double or jacketed vessel; L L, the legs.

C C^2 is the laminated bar.

D D is an adjustable bar, to which the laminated bar is secured by the rivets *r r*. Said laminated bar is bent double at S and returned over itself, reaching to below the outlet G^2 of the gas-inlet pipe G.

J J′ is a chamber extending into the vessel B. It may be made of any suitable form to contain the cut-off mechanism.

E E^2 are the stem and index-disk for independently raising and lowering the bar D, and so setting the laminated bar C C^2 where it should be to regulate the desired heat of the vessel's contents.

X is the steel, and Z is the brass, of the laminated cut-off bar C C^2.

a is the section of a clasp which holds the fixed end of the bar D.

F is a small screw-plug with a hole extending longitudinally into its inner end, and another hole from the circumference of the screw-plug connecting with the hole in the end. The hole from the circumference coincides with a hole in the cap *e* leading into the interior annular chamber, *f*, of the said cap. This hollow screw-plug serves to allow a small supply of gas to pass in the direction of the arrows into the chamber *f*, thence through the chamber J, and thence into the pipe H, leading to the burning-orifice. The gas passing through this screw-plug serves to retain a very small jet of flame, which keeps the burning-orifice lighted when the gas-supply through the tube G at G^2 is automatically cut off by the laminated bar C C^2. The amount of gas which passes through the screw-plug F is governed and reduced by turning the said plug, which throws its circumferential hole out of coincidence with the hole in cap *e* leading to the chamber *f*.

G G^2 is the gas-inlet pipe, which is to be connected with the gas-supply.

g is a piece of soft metal or other suitable substance secured to the laminated cut-off bar C C^2, furnishing a readily-conforming seat for closing the bottom of tube at G^2.

H is a pipe which leads from chamber J to the burning-orifice at I.

m is a spreader, against which the flame strikes, which spreads the flame over the bottom of the vessel and protects the small retaining-jet from extinguishment. Passages for the upward induction of air around the burning-orifice I are provided underneath, the air so inducted being confined within the cylinder K and mixed with the gas to give better combustion.

The lower end of stem E is threaded, (a double thread being preferable,) and screws into bar D near its end, the said stem being

prevented from moving longitudinally by being confined between the packing *p* and the top of the nipple V, the packing being pressed down by the screw-cap *b*. The top of the disk E^2, which serves to turn it, may be marked with an index showing the degree of heat desired to be regulated by the automatic cut-off, a pointer, *k*, being set at the side of said disk.

My automatic regulator may be used in a single vessel, B, without the inner vessel, A. When the inner vessel is used, it may be surrounded by any substance which will conduct heat from the outer vessel.

The operation of my invention is further and fully described as follows: The space between the vessels A and B being supplied with a heat-conducting substance surrounding the chamber J, the gas-supply is connected with the tube G and the gas ignited at the burning-orifice I. When the contents of the inner vessel, A, are heated to a given degree, as indicated by an inserted thermometer, the stem E E^2 is to be turned until the bar D is raised by the screw, so that the laminated cut-off bar C C^2 is pressed against the bottom of the inlet-tube at G^2, which stops the supply of gas, excepting what little passes through the screw-plug F for retaining the flame. This movement of the adjusting-stem E sets the cut-off bar C C^2 to always cut off the supply of gas automatically at the set degree of heat. When the heat of the vessel's contents diminishes, the end C^2 of the laminated cut-off bar C C^2 moves away from the end G^2 of the tube, by reason of the differential contraction of the brass and steel laminæ on cooling, and the gas is resupplied to the flame under the vessel. On an increase of heat again the end C^2 of the laminated cut-off bar moves toward the end G^2 of the inlet-tube to close the orifice by the differential expansion of the brass and steel laminæ of the cut-off bar C C^2 and the supply of gas is again checked.

It will be understood that the expansion of brass under heat is greater than that of steel, and the brass being the lower lamina from the bend at S to the end G^2 of the inlet-tube the cut-off bar is moved toward the end G^2 of the inlet-tube when heated, and from the tube when it cools.

The advantage of my improved automatic heat-regulator is that the temperature at which food or other substances can be maintained in heating is under perfect automatic regulation and control, which advantage is obvious in the case of food or drink which has to be kept at a suitable degree of warmth for invalids and infants. It is therefore useful as a hospital and nursery appliance, and may also be applied to the production and regulation of heat in the general arts and sciences.

I claim—

1. The automatic gas-supplying and heat-regulating device consisting of the tube G G^2, screw-plug F, and cap *e*, in combination with the laminated cut-off bar C C^2 and seat *g*, chamber J, the outlet-pipe H, and the burning-orifice I, operating as described, and for the purpose or purposes specified.

2. In a cooking or warming vessel, the combination of the adjustable bar D, laminated cut-off bar C C^2, and the adjusting and index stem E E^2, operating as described, in combination with the passages G, G^2, J, and H, and burner I, and for the purpose or purposes specified.

3. The automatic heat-regulating cooking and warming vessel consisting of the vessel B, in combination with the chamber J, adjustable bar D, laminated cut-off bar C C^2, seat *g*, adjusting-stem and index E E^2, nipple V, cap *b*, tube G G^2, cap *e*, screw-plug F, outlet-pipe H, and burning-orifice I, operating as described, and for the purpose or purposes specified.

4. The automatic heat-regulating double cooking and warming vessel, consisting of the vessels A and B, in combination with the chamber J, adjustable bar D, laminated cut-off bar C C^2, seat *g*, adjusting-stem and index E E^2, nipple V, cap *b*, tube G G^2, cap *e*, screw-plug F, outlet-pipe H, and burning-orifice I, operating as described, and for the purpose or purposes specified.

ANDREW JACKSON SIMPSON.

Witnesses:
J. J. JUDKINS,
S. H. CHERRINGTON.