W. P. HALL, DEC'D.

A. L. HALL, ADMINISTRATRIX.

DRAFT REGULATING DEVICE FOR FURNACES.

APPLICATION FILED JAN. 5, 1910.

965,815.

Patented July 26, 1910.

2 SHEETS—SHEET 1.

FIG. 1.

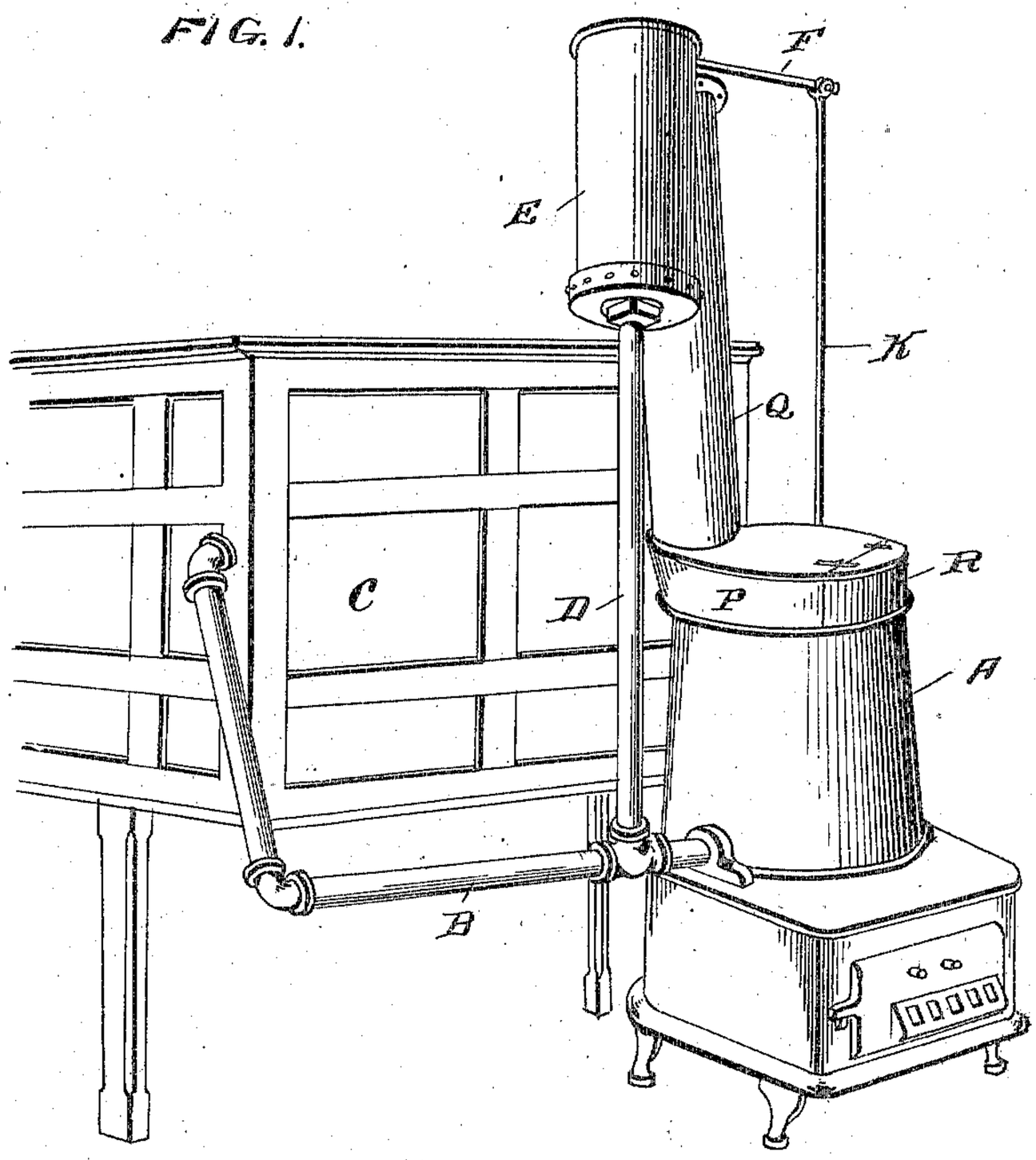
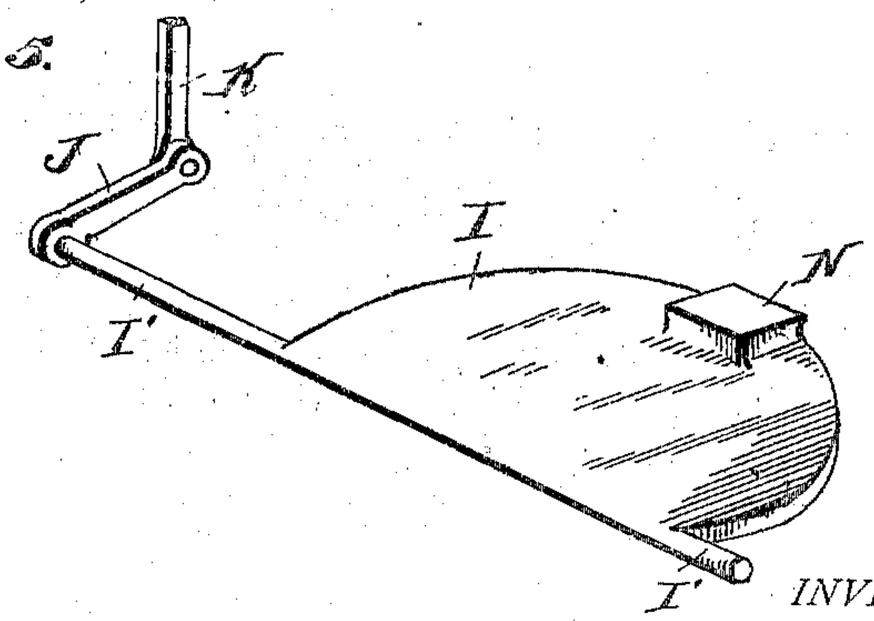


FIG. 5.



WITNESSES

Chas. K. Davies,

Christ Finke, Jr.

INVENTOR,-

Wilber P. Hall,

By Emil Neukart Attorney

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2 SHEETS—SHEET 2.

FIG. 2.

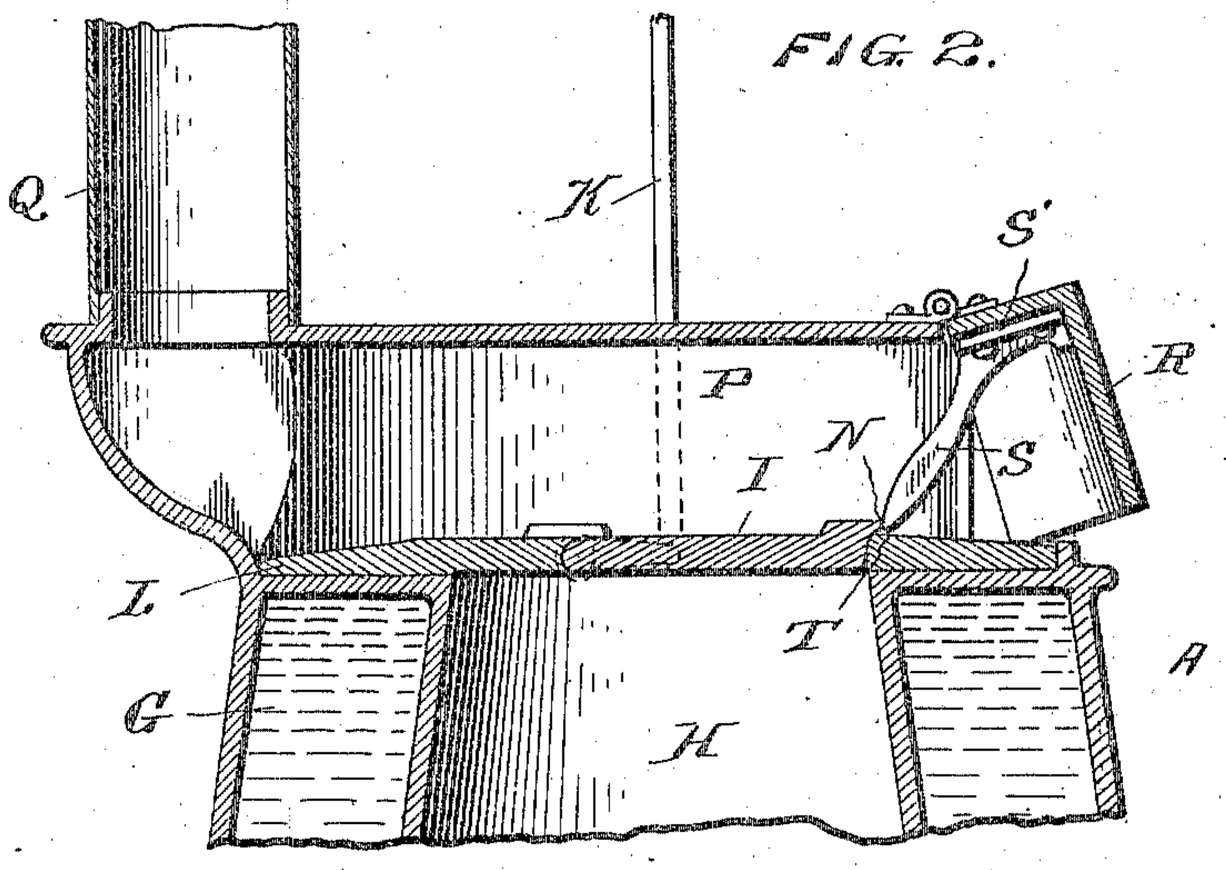


FIG. 3.

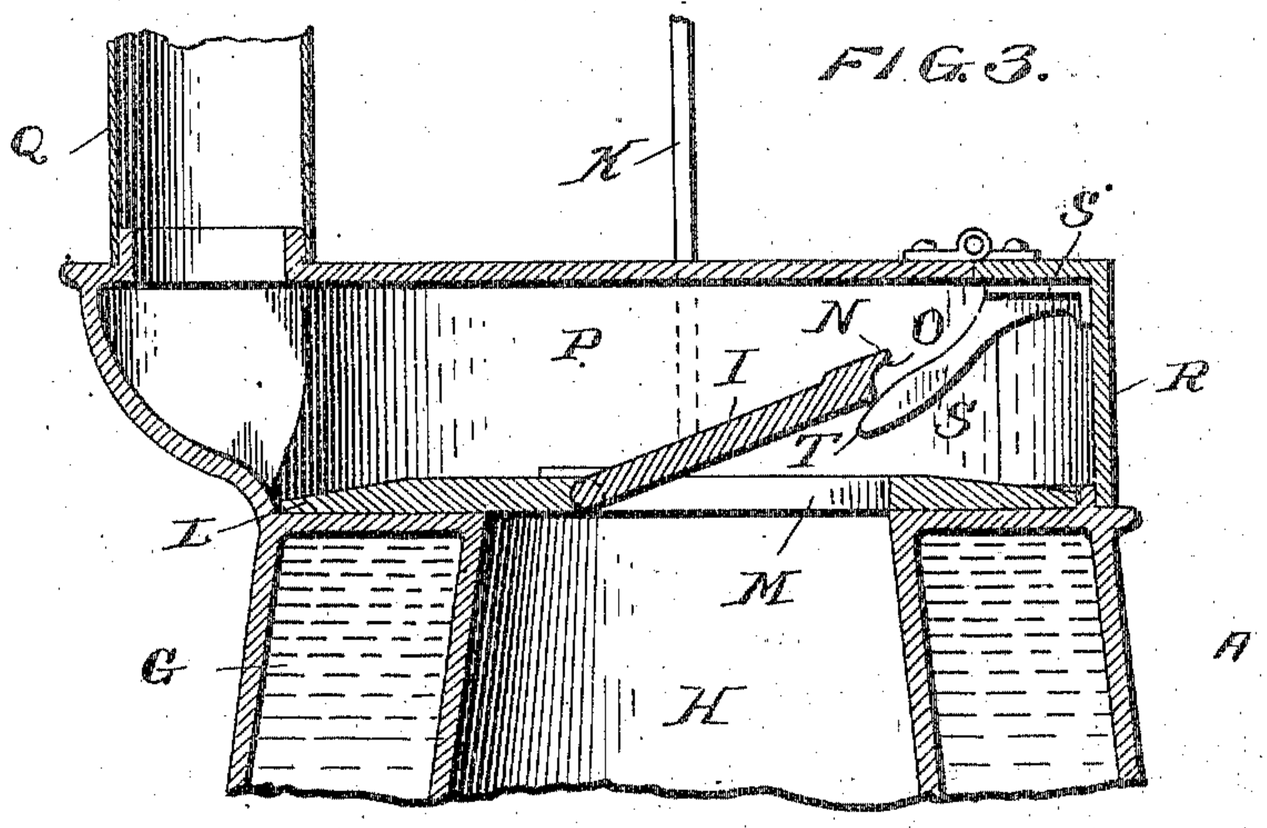
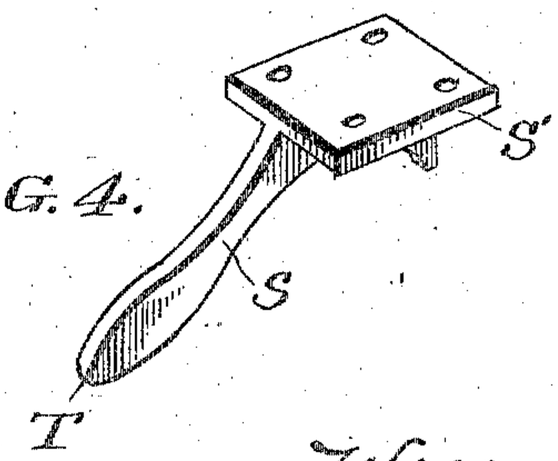


FIG. 4.



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By Emil Neubark Attorney.

UNITED STATES PATENT OFFICE.

WILBER P. HALL, OF PEMBROKE, NEW YORK; ALIDA L. HALL ADMINISTRATRIX OF SAID WILBER P. HALL, DECEASED.

DRAFT-REGULATING DEVICE FOR FURNACES.

965,815.

Specification of Letters Patent. Patented July 26, 1910.

Application filed January 5, 1910. Serial No. 536,518.

To all whom it may concern:

Be it known that I, WILBER P. HALL, a citizen of the United States, and resident of Pembroke, in the county of Genesee and State of New York, have invented certain new and useful Improvements in Draft-Regulating Devices for Furnaces, of which the following is a specification.

The present invention relates to an improved draft regulating device for furnaces, particularly such as are adapted for use in supplying heat to incubators and analogous apparatus.

The essential object of the invention is the provision of a simple and compactly arranged medium for increasing or diminishing the intensity of heat produced in the furnace, and thus control the temperature of the incubator to which the furnace is attached, for the purpose of maintaining a desirable and steady degree of heat in the incubator.

The invention resides primarily in an improved damper and cold air door combined with the furnace, and operating means therefor, and these devices are actuated synchronously by changes in temperature of the heating medium.

The invention further consists in certain minor details of construction and arrangements of parts as will be hereinafter pointed out.

In the accompanying drawings I have illustrated one example of the physical embodiment of my invention, constructed according to the best mode I have so far devised for the practical application of the principles.

In the drawings, I have exemplified the invention as adapted for use and applied to an incubator, which is heated by hot water, but it will be understood that the invention is also applicable for other uses where desired.

In the drawings:—Figure 1 is a perspective view showing the invention applied for use with an incubator. Fig. 2 is a vertical section through the upper part of the furnace. Fig. 3 is a view similar to Fig. 2, but showing the damper or draft regulator and the cold air door in another position. Fig. 4 is a detached perspective view of the operating arm secured to the cold air door, and Fig. 5 is a perspective view of the damper, and part of its actuating mechanism.

As illustrated in the drawings, the furnace A is constructed as a hot-water heater, and is provided with the supply pipe B which leads to and enters the incubator C, and after passing through the wall of the incubator as shown, connects with the usual hot water coils therein, the return pipe leading to the furnace, as usual. The vertical pipe D which is connected with the supply pipe B, enters the expansion tank E, in which is contained a sufficient quantity of oil for the purpose of actuating a float or other buoyant device, not shown, which is actuated by the expansion or diminution of the water in the stand pipe D. A lever F is pivoted on the tank and at its inner end is connected in an operative manner with the float, in such manner that its outer end may be raised or depressed, for a purpose to be described.

Referring particularly to Figs. 2 and 3 it will be seen that the furnace is equipped with a water jacket G which surrounds the combustion chamber H, and said chamber may be closed at its top by means of the draft regulator or damper I. This damper, as clearly seen in Fig. 5, is formed with a pair of trunnions I′, one of which is elongated and has attached thereto a crank arm J, which is connected by means of the rod or link K to the lever arm F, above referred to. The trunnions form journals for the movement of the damper and are seated in suitable bearings in the plate L which is provided with an opening or seat M for the damper. The forward end of the damper is formed with a projecting lug or lip N the under face of which is inclined as at O.

The dome P of the furnace is provided with the usual smoke stack Q, and at its front is recessed for the reception of the hinged cold air door R. The operating arm S, very clearly shown in Fig. 4, is secured to the inner side of the door, by means of the flange S′, and the arm is so located that its free end is in constant contact with a portion of the front end of the damper I. Thus in Fig. 2, with the damper in closed position, the arm contacts with the lug N, and the door is held open; and in Fig. 3, with the damper raised to open position, the end of the arm is in engagement with the lower edge of the front end of the damper. It will be noted that the extreme end of the arm S is beveled as at T, and this formation facilitates the co-action of the parts of the

lever arm S and damper, and prevents undue friction or obstruction of movement.

The operation of the devices will be evident. When the float in the expansion tank is lifted, due to expansion of heated water in the pipe D, the outer end of the lever F is depressed. Thus, should the temperature in the incubator rise to an undesirable degree, the expansion of the hot water actuates the lever F and rod K, the latter being depressed as will be understood, and, through the crank arm J, the damper I (Fig. 3) is returned to closed position, as in Fig. 2. The movement of the damper in closing rides down the arm T of the cold air door, and the door is thus caused to swing upon its hinges, outwardly. In this manner the draft through the combustion chamber is regulated by the damper, and the admission of cold air to the dome of the furnace is controlled by the movement of the cold air door.

When the water, for any undue reason, becomes dispossessed of a desirable degree of heat, the float in the expansion tank falls. This movement lifts the lever F, and through the connections, the damper I, permitting a draft through the opening M. The upward movement of the damper permits the cold air door to swing, by gravity, to a closed or partially closed position. Under these conditions, the intensity of heat in the furnace may be increased, and likewise the degree of temperature imparted to the water increased to provide a desirable atmospheric condition in the incubator.

It will be understood, of course that the movement of the devices, due to the expansion or contraction of the water, is gradual, and that the admission of cold air to the dome and the draft from the furnace are regulated in a steady and desirable manner. Under these circumstances, the danger of overheating the eggs contained in the incubator is eliminated, and a normal degree of heat is maintained therein.

From the above description taken in connection with the drawings, it is evident that I have produced a device of this character which fulfils the conditions requisite for an efficient and reliable regulator.

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

1. The combination with a furnace having a fire chamber provided with a port at the upper end, of a damper adapted to fit in and close said port, said damper having integrally formed pintles thereon journaled in the sides of the furnace, an undercut lug carried by the edge of the damper, a draft door carried by the furnace, an inwardly projecting lug carried by the said door and adapted to engage said lug, and thermostatic means for automatically opening and closing the damper, the closing thereof serving to force the undercut or cam portion of the lug against the lug on the door to force the latter open.

2. In a brooder regulator, the combination with the brooder, of a coil for heating the same, a furnace for heating the coil, said furnace having an aperture in the top of the fire chamber, a damper for closing said aperture, a draft chamber above the fire chamber provided with a port, a door for closing said port, a lug carried by the door and engaging the damper, an expansion chamber in the coil, and connections between said chamber and the damper for closing the latter upon the overheating of the coil, the damper being provided with a projecting lug having a cam or sloping face adapted at all times to be in contact with the lug carried by the door, the closing of the damper causing the cam face of the lug to bear down upon and depress the lug on the door, thus forcing the door open to admit a draft, forcing the door of the draft port open.

3. In a furnace, the combination with the fire pot provided with a port, of a pivotally mounted damper adapted to serve as a closure therefor, thermostatic means for opening and closing said damper, an angular door carried by the furnace for controlling the draft opening thereof, a plate secured to the door below its point of pivotence, an inwardly extending arm or lug carried by the plate and provided with a cam shaped end, and an integral projection on the damper adapted to bear upon said end to depress the same as the damper is closed, said pressure swinging the door open to admit a cooling draft.

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

WILBER P. HALL.

Witnesses:
JAMES E. PAXON,
WM. L. PAXON.