

No. 769,844.

PATENTED SEPT. 13, 1904.

G. R. SMITH.

DAMPER REGULATOR.

APPLICATION FILED OCT. 10, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

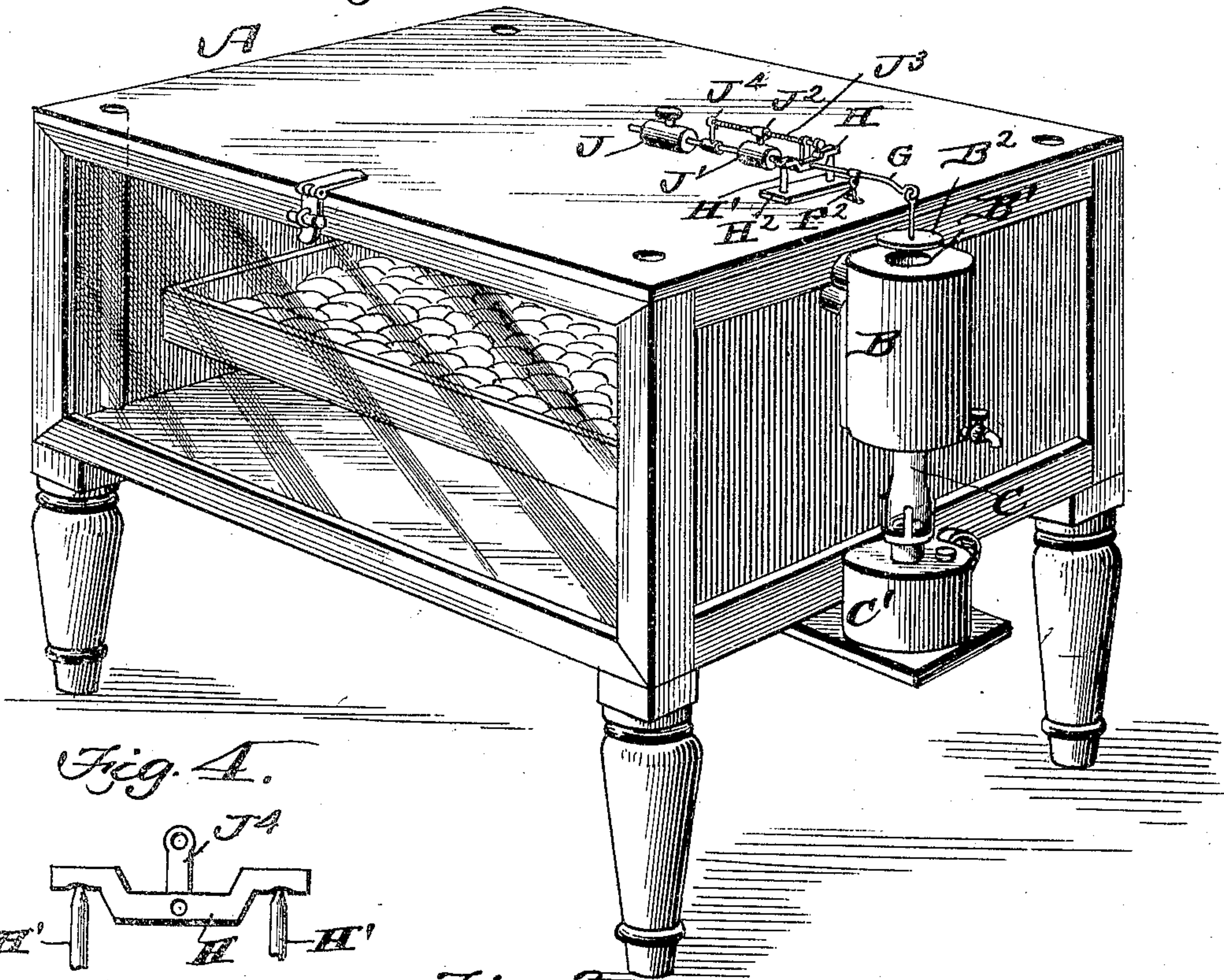


Fig. 4.

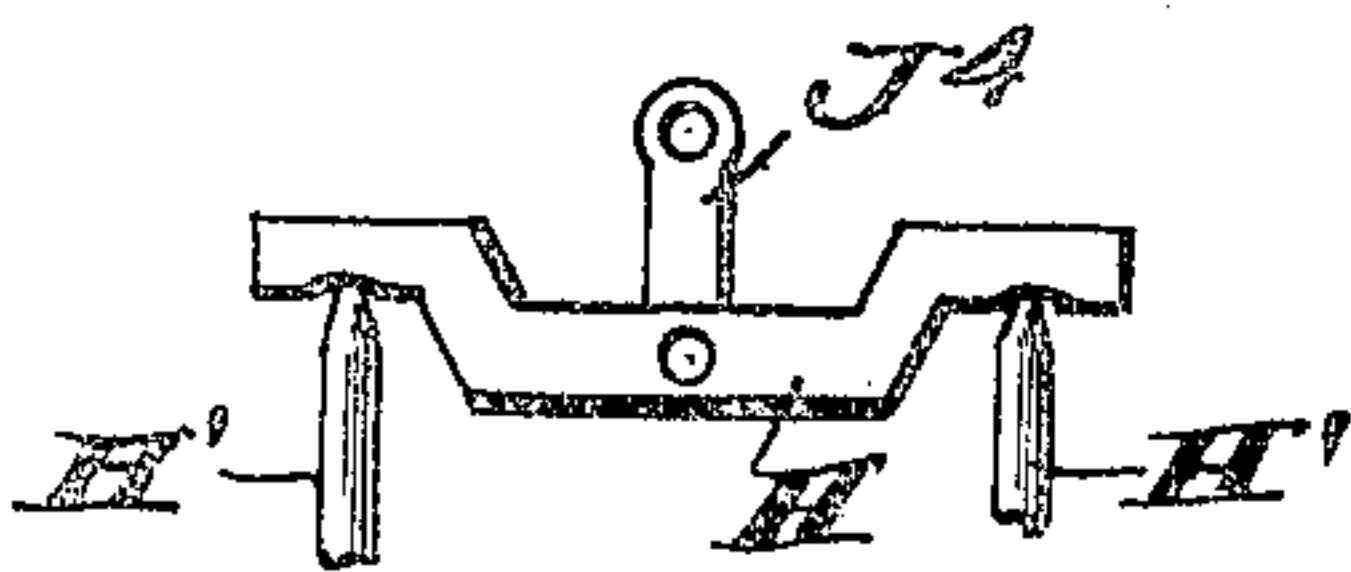
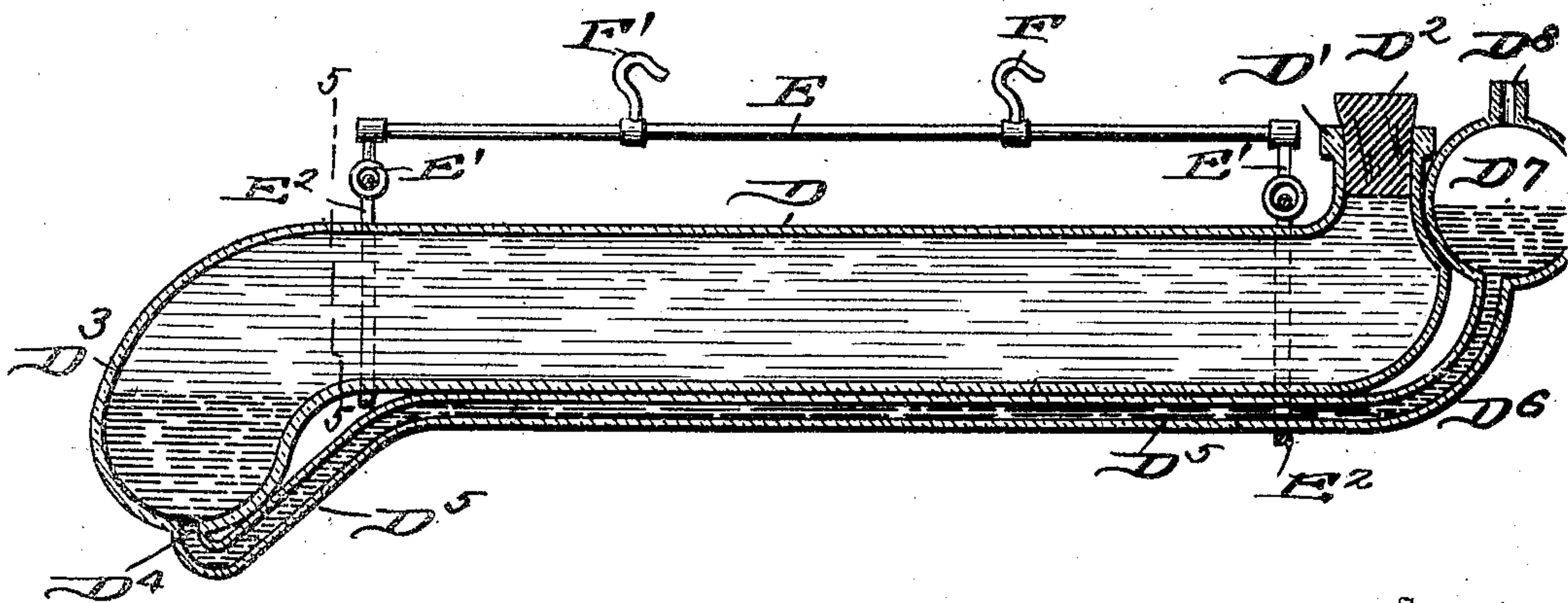


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 2.

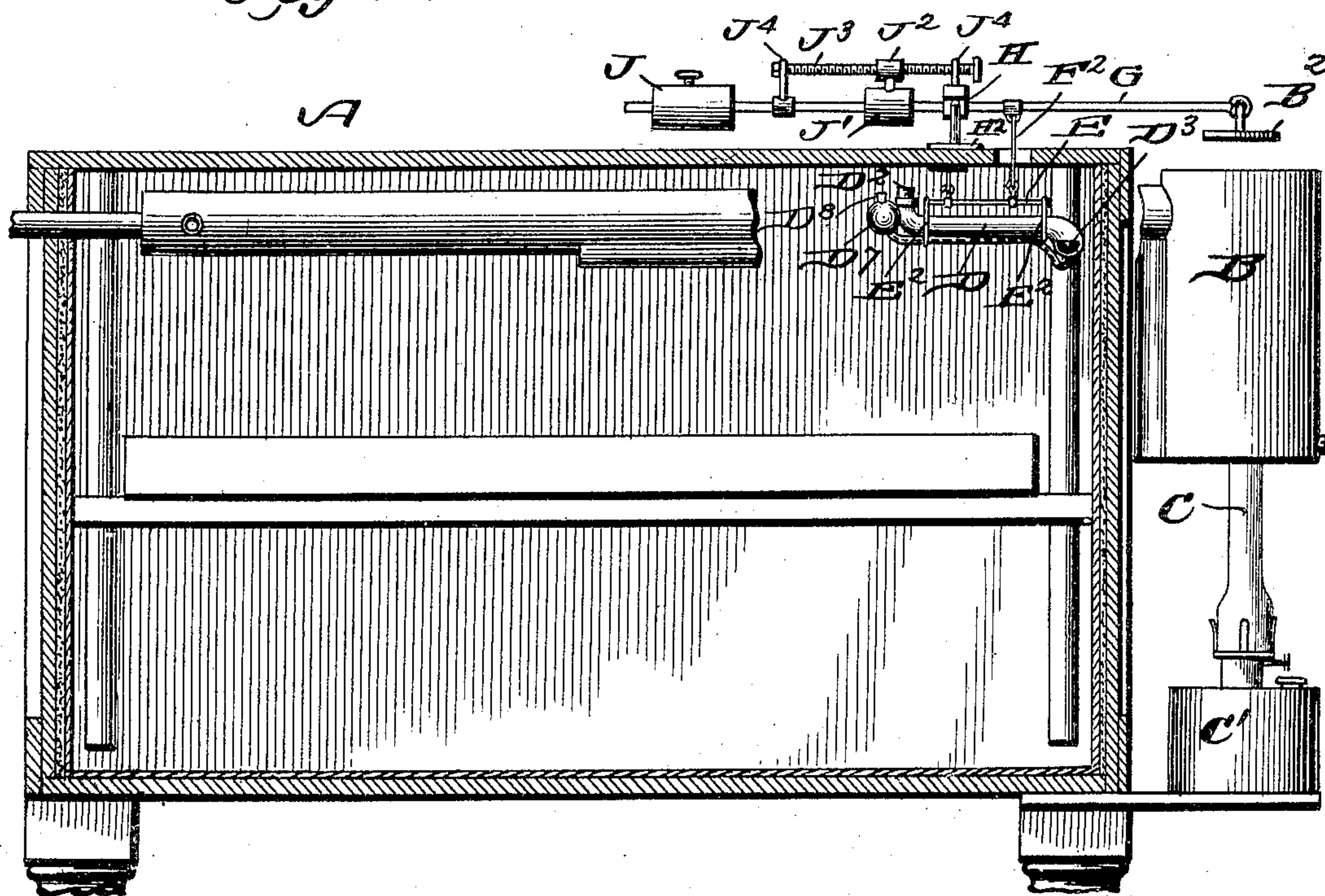


Fig. 5.

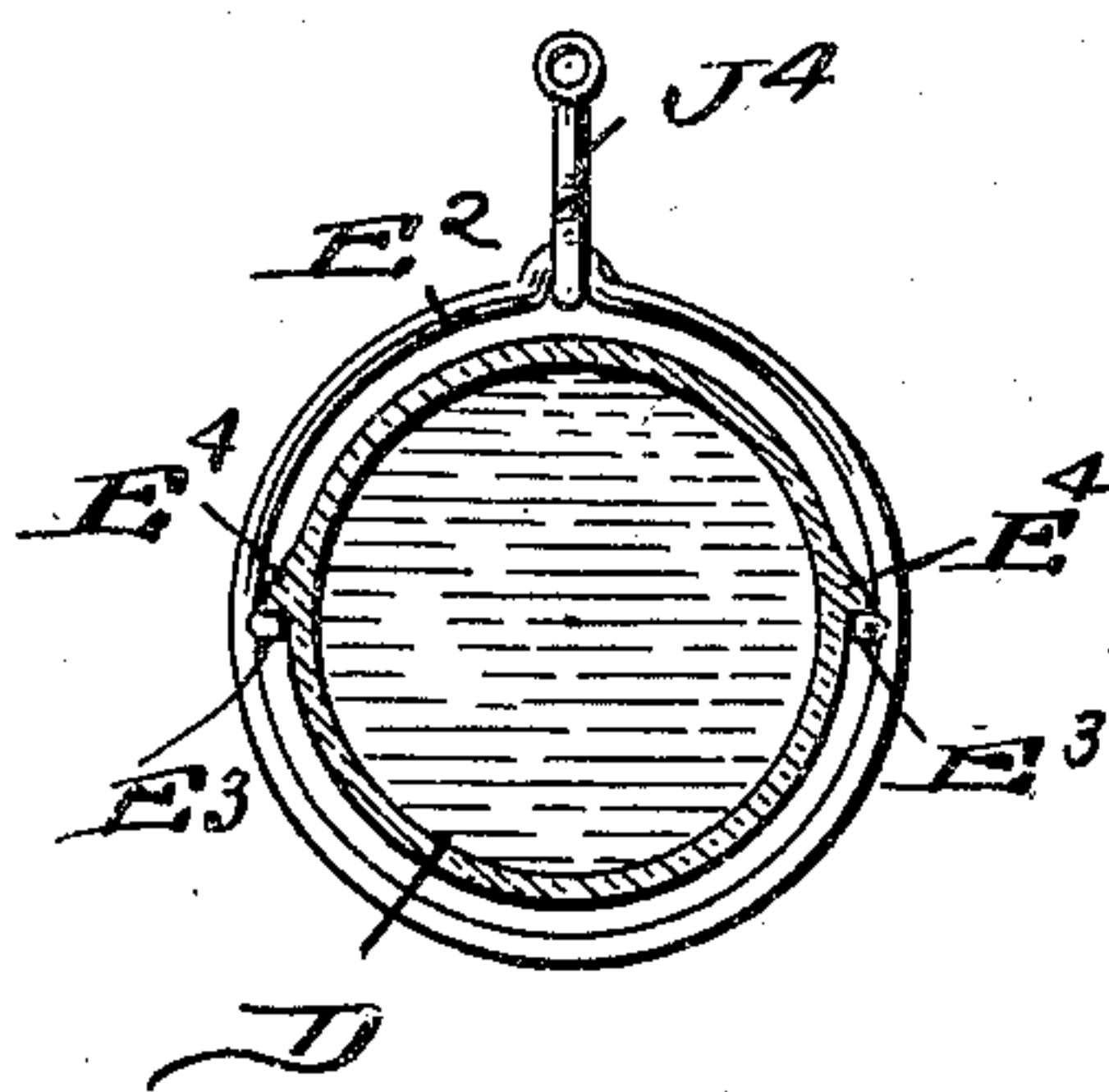
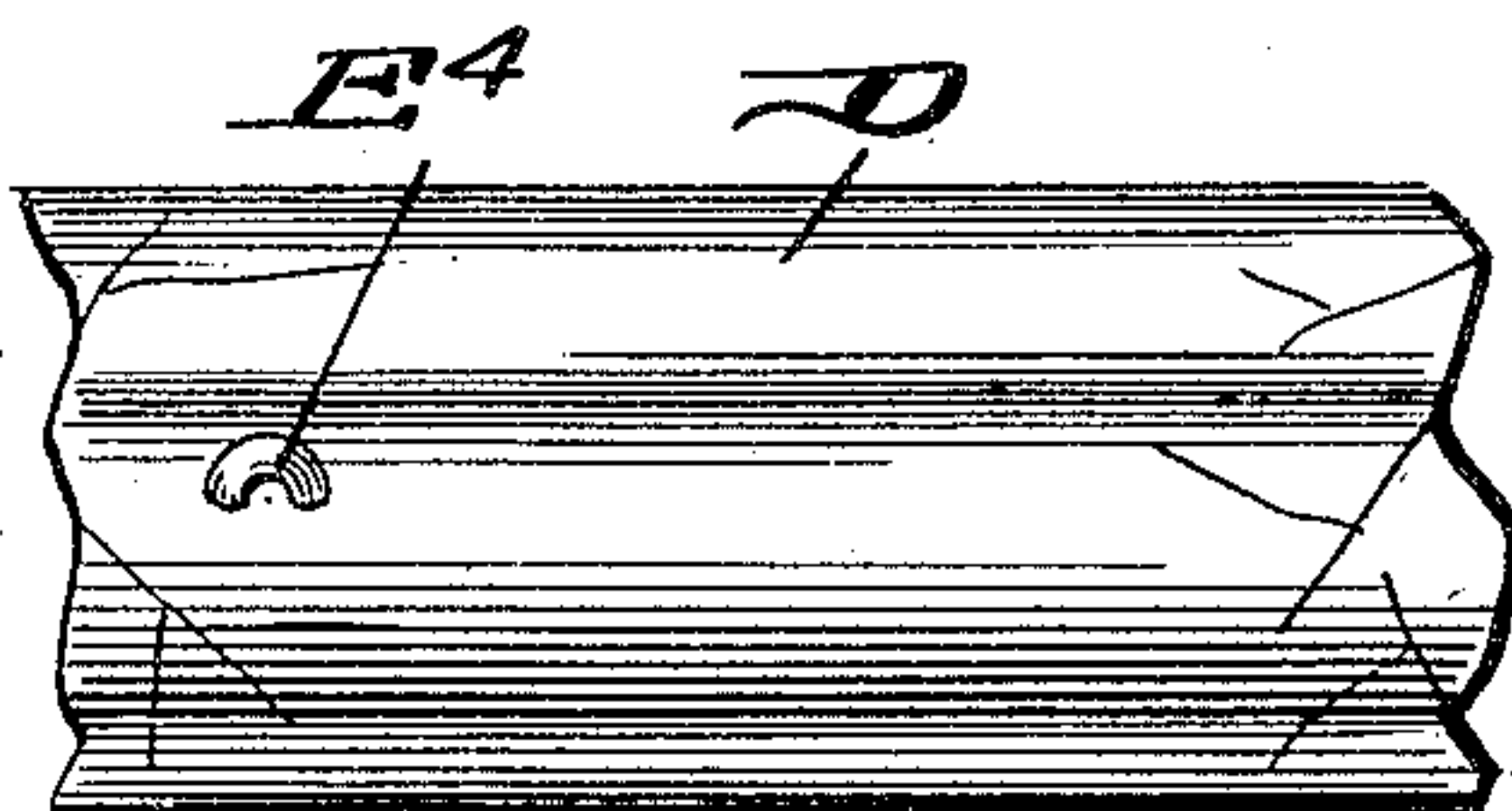


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE RAYMOND SMITH, OF LATROBE, PENNSYLVANIA.

DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 769,844, dated September 13, 1904.

Application filed October 10, 1903. Serial No. 176,517. (No model.)

To all whom it may concern:

Be it known that I, GEORGE RAYMOND SMITH, a citizen of the United States, residing at Latrobe, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Damper-Regulator, of which the following is a specification.

This invention relates to means for regulating the temperature of an incubator, being especially adapted for use with the heating system for incubators shown and described in my application for patent filed June 28, 1902, Serial No. 113,612. It will be understood, however, that this regulator can be applied to other systems of heating incubators and can also be used in connection with heating compartments other than incubators, and I do not desire to confine myself to its use in connection with an incubator.

My invention consists in the novel features of construction and combination of parts hereinafter shown and described, particularly pointed out in the claims, and shown in the accompanying drawings, in which—

Figure 1 is a perspective view showing the practical application of my invention to an incubator. Fig. 2 is a longitudinal section through the incubator, the damper-regulator being shown in elevation. Fig. 3 is a detail longitudinal section taken through the mercury-holder of the regulator. Fig. 4 is a detail of construction showing the means for supporting the regulating apparatus. Fig. 5 is a section on the line 5 5 of Fig. 3, and Fig. 6 is a detail side view of a portion of the mercury-holder.

Referring to the drawings, A indicates the incubator-case, which may be of any desired shape and construction.

B indicates the water-heater, which is essentially cylindrical in shape and has a centrally-arranged flue B', in which is arranged the chimney C of the lamp C'.

In order to provide for the regulation of the heat, so that the temperature of the incubator can be maintained at a specific degree, I employ the regulator which is the subject of the present application and in the construction of which I use a horizontal vessel D, having an upwardly-extending neck D' at one

end through which the contents of the vessel can be expelled, said neck being normally closed by means of a plug D². The opposite end of the vessel is turned downwardly, providing a basin or bulb D³, having an opening D⁴ in the lower end thereof, giving a communication with a fine tube D⁵, which extends along the bottom of the vessel D, is turned upwardly, as shown at D⁶, and terminates in a spherical bulb D⁷, having a vent-opening D⁸. The basin D³ is intended to receive mercury, and the vessel is preferably filled with alcohol, ether, or some similar volatile liquid which quickly expands, thereby forcing the mercury from the basin through the pipe up into the bulb. The vessel D and attached parts are suspended from a bar E by means of links E' through the medium of rings E², having inwardly-projecting lugs E³, which are adapted to engage the bearing-lugs E⁴, formed integral upon the exterior sides of the vessel D, thereby permitting the vessel to oscillate easily for the purpose hereinafter explained. The rod E has two hooks F and F' extending upwardly therefrom, the hook F' being connected to a lever G by means of a link connection F², the hook F engaging a suitable eye or hook secured in the top of the incubator, while the rod E serves to suspend a vessel within the incubator adjacent the top. The link F² passes up through the top of the incubator and, as before stated, is connected to the lever G, which passes through a beam H, fulcrumed upon the ends of pointed tapering pins H', projecting upwardly from the plate H², secured upon the top of the incubator-casing, and it will be clearly seen by reference to Fig. 1 of the drawings that the fulcrum-points of the bar are considerably higher than the point through which the lever G passes, and by this arrangement the lever G, carrying the cover, is permitted to raise or lower the cover in a more perfect and gradual manner. This cover B² is adapted to close the flue B' and is suspended from the forward end of the lever.

The lever G has the weight J adjustably mounted upon its inner end, and a counterpoise-weight J' is arranged on the lever intermediate its ends, so that the lever can be ad-

justed very accurately, whereby the slightest change of the vessel D will serve to operate the cover B² and through the lever G, and in order to accomplish this accuracy of operation I provide the counterpoise-weight with threaded sleeve J², through which works the screw J³ through ears J⁴, projecting upwardly from the beam H and lever G, as more clearly shown in Figs. 1 and 2, and by turning the screw in either direction the counterpoise-weight is moved along the lever.

The operation of the regulator is as follows: When the temperature within the incubator reaches a point whereat the fluid within the vessel D expands to such a point as to drive the mercury up into the bulb, the weight of the mercury within the bulb causes the vessel to turn upon the hook F as a pivot and in doing so removes the tension upon the link F² and permits the lever G to move upwardly, thereby lifting the cover B², permitting the major portion of the heat units to pass out of the top of the flue B'. As soon as the temperature falls within the incubator the mercury will descend and assume its normal position in the bottom of the basin D³, and the vessel will then be turned upon the hook F, pulling down upon the lever G and forcing the cover B² down upon the top of the flue B', and the major portions of the heat units will then be directed through the heating-pipe into the incubator. By means of this regulation the temperature of the incubator can be maintained at a uniform degree, and by the employment of the adjustable counterpoise the operation of the regulator can be adjusted to an exceedingly fine degree.

It will thus be seen that I not only provide an improved regulator to be used in connection with an incubator, whereby the heat can be directed into the incubator or permitted

to escape, but I also have a regulator which can be used to operate a damper in connection with a heating system independent of an incubator, and I desire it understood that I reserve the right to make such alterations as will come within the scope of my invention without departing from the broad principle thereof.

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

1. A damper-regulator of the kind described comprising a fulcrum-bar, supported from a suitable base, a lever passing through and transverse to said bar, the fulcrum-points of the bar being in a plane above the lever, an adjustable counterpoise-weight on the lever, a weight adjacent the rear end of the lever, a damper, means connecting the damper with the forward end of the lever, and means for lowering the forward end of the lever on a decrease of temperature and for raising the forward end on an increase of temperature.

2. A regulator of the kind described comprising a plate having vertical pins thereon, a fulcrum-bar having its ends resting on the pins and its intermediate portions in a plane below the ends, a lever carried by said intermediate portion of the bar, adjustable weights on the lever, a vessel adapted to contain mercury and a volatile liquid, means for pivotally suspending said vessel, whereby it will oscillate with the rise and fall of the temperature, means for connecting the vessel with the lever, and means whereby movement of the lever will actuate a damper.

GEORGE RAYMOND SMITH.

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