

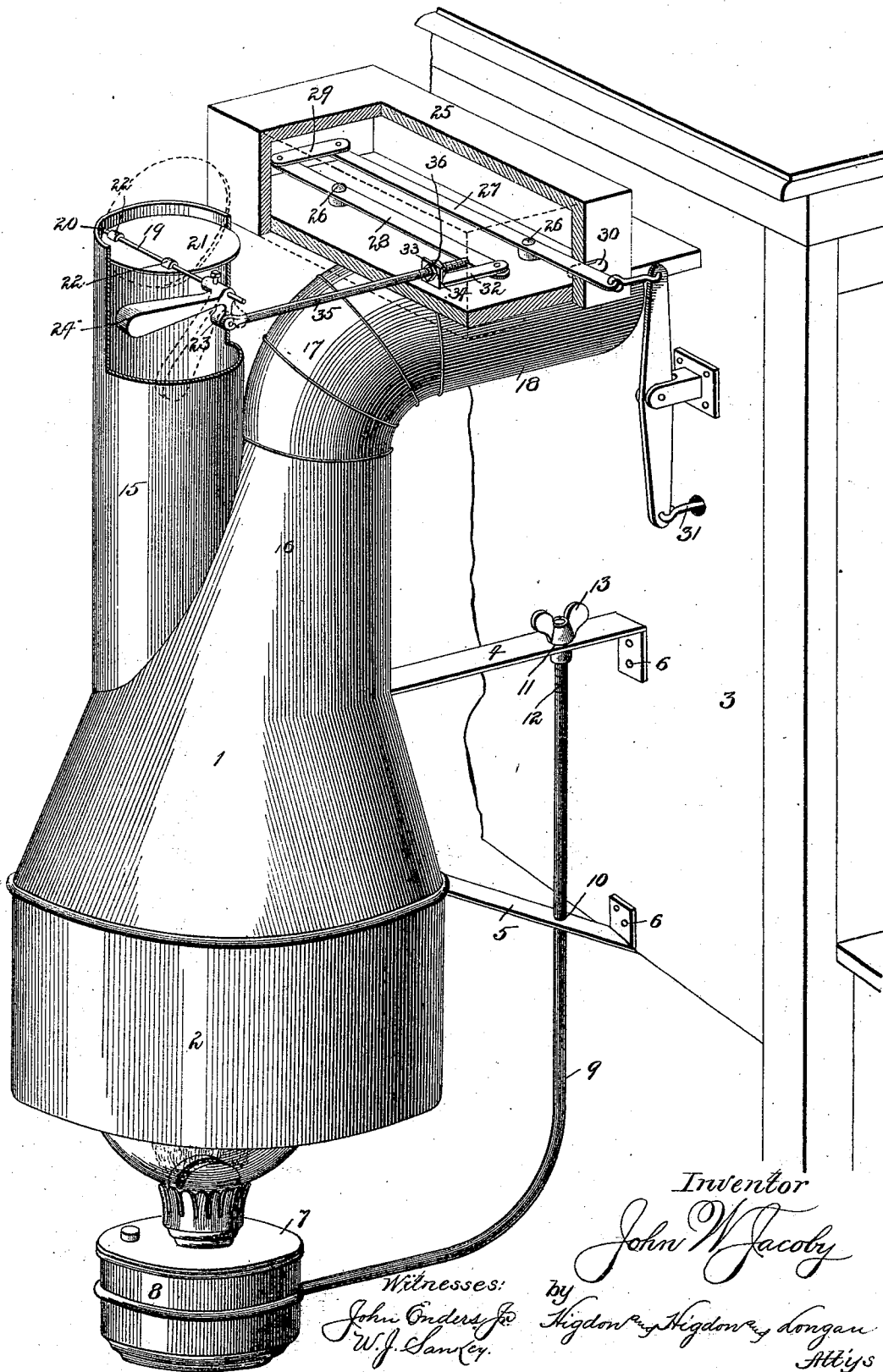
(No Model.)

J. W. JACOBY.

HEAT REGULATING VALVE FOR INCUBATORS.

No. 516,491.

Patented Mar. 13, 1894.



UNITED STATES PATENT OFFICE.

JOHN W. JACOBY, OF ST. LOUIS, MISSOURI.

HEAT-REGULATING VALVE FOR INCUBATORS.

SPECIFICATION forming part of Letters Patent No. 516,491, dated March 13, 1894.

Application filed June 5, 1893. Serial No. 476,568. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. JACOBY, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Heat-Regulating Valves for Incubators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming a part hereof.

My invention relates to an improved thermostat or heat regulating device for incubators, and consists in the novel construction, combination and arrangement of parts hereinafter described and designated in the claims.

The object of my invention is to provide an improved device of this kind which shall be very sensitive and effectually control the temperature of the incubator to which it is attached, so that the variations in such temperature will be very slight, and which device shall be simple in construction and of reasonable cost.

In the drawing: the figure is a perspective view of my invention, with parts in section and broken away, applied to an incubator.

As my invention does not reside in the interior construction of the incubator, I have deemed it unnecessary to illustrate the same, my invention being capable of application to any known or common form of incubator. I have found that it is desirable to retain the temperature of the interior of the incubator as near as possible at 102° Fahrenheit or at least within the limits of from 101° to 104°, in order to obtain the most satisfactory results. This I accomplish very readily by the use of my invention which may be described as follows:

1 indicates a vertical hood, which is preferably bell-shaped, or flaring, having an open lower end 2 which is of greater diameter than its upper end, and which is supported in position closely adjacent one side or end 3 of the incubator, by means of suitable braces 4 and 5 having their outer ends extending to said hood and their bodies extending in about the horizontal plane so that their inner ends may be secured to said adjacent side or end of the incubator, which is done by means of suitable screws or other fastenings 6. A lamp 7 of any common construction is located directly beneath the lower open end of

the hood 1, and is provided with the usual burner, wick and chimney, so as to radiate heat in or into said hood. This lamp is made vertically adjustable, as well as horizontally adjustable, by being mounted in a supporting ring 8 carried by the free outer end of an L-shaped arm 9. The vertical body of this arm 9 is loosely located in vertically aligned openings or bearings 10 and 11 formed in the braces 5 and 4 respectively, and the upper portion of this body is provided with screw threads 12 and a thumb nut 13 engaging said screw threads and resting upon the upper surface of the horizontal brace 4, so that by removing the chimney of the lamp 7 said lamp and the arm 9 may be swung around until the lamp is removed from beneath said hood, and so that said lamp may be vertically adjusted nearer to and farther from the open end of said hood by turning the nut 13 upon the threaded arm 9, thereby sliding said arm in said bearings with the desired effect. The upper portion of the hood 1 is provided with two separate branches or forks, or I may say that it is bifurcated, there being a vertical branch 15 having an open upper end with its lower end communicating with said hood, and a shorter branch 16 having an elbow 17 mounted upon its upper end. The interior of the branch 16 of the elbow 17 communicates with the interior of the hood. The vertical branch 15 is adapted to discharge the heat of the lamp 7 into the atmosphere upon the outside of the incubator, while the branch 16 is adapted to discharge said heat into the elbow 17, and into a horizontal hot-air pipe 18 extending to the interior of the incubator, and arranged therein in any known manner, as the expansion device of the incubator may act, in the manner hereinafter described.

19 indicates a horizontal pin or shaft which is mounted in bearings such as 20 in the sides of the vertical branch 15 of the hood, very closely adjacent the upper open end thereof. The bearings 20 in said branch are not located diametrically opposite, but are located opposite a little to one side of the center of the bore of said branch.

21 indicates a valve, which is preferably in the form of a circular disk and adapted to close and open the upper end of said branch. This valve is fixed upon the shaft 19, by means

of perforated ears 22 located upon its upper surface and engaged by said shaft, or in any desired common manner, so that said valve will be pivotally mounted in the said upper
 5 end of said branch and fixed upon said shaft with the preponderance of surface and weight of said valve at one side of said shaft. One end of said shaft projects and has fixed upon it a downwardly projecting arm 23 and a counterbalance weight 24. The arm 23 and the
 10 said counterbalance weight 24 are preferably cast integral of a single piece of metal, with said weight extending at a right angle to said arm and extending in the same plane that the valve 21 is located in, the preponderance
 15 of weight of the valve being located upon one side of said shaft and said weight projecting upon the opposite side of said shaft so that said weight will almost counterbalance said valve, but yet leave a preponderance of gravity
 20 in said valve, so that it normally tends to move downward.

25 25 indicates a rectangular box or casing which is located upon the exterior of the incubator and preferably has its bottom resting upon the horizontal hot air pipe 18. Pivotally mounted upon vertical pins 26 in said box are two or more levers 27 and 28, which are connected by a link 29, so as to form a system of
 30 compound or multiplying levers, so that a slight movement of the expansion rod or device located upon the interior of the incubator will cause an increased or greater movement of the valve 21, which is connected to said expansion
 35 device in a manner hereinafter described. One end of the lever 27 projects through a horizontal slot 30 formed in one end of the box 25, and is connected by means of a rod 31 to the expansion device or rod of any common
 40 form, which is to be located upon the interior of the incubator in any known manner. The free end of the lever 28 is provided with a link 32 having an upturned free end 33, and this upturned end is provided with a perforation
 45 34. A horizontal connecting rod 35 has its outer end pivotally connected to the arm 23 below the shaft 19, and its inner end adjustably located in the perforation 34 of the upturned end 33 of the link 32. The inner
 50 portion of the connecting rod 35 is provided with screw threads and has a threaded nut 36 mounted upon said screw threaded portion upon the inner side of said upturned portion of the said link, so that by turning said nut
 55 the arm 23 will be adjusted nearer to or farther from said link 32, and so that the relative position of the valve 21 and the expansion device upon the interior of the incubator, may be regulated and fixed. It is desirable that when the temperature of the interior
 60 of the incubator falls to 101°, the valve 21 shall be fully closed, and so that when said temperature rises to 104° the said valve shall be opened as shown by dotted lines, and the
 65 adjustment of the nut 36 is made accordingly.

The operation is as follows: The lamp 7 is first to be properly trimmed and the arm 9

swung around so that said lamp will be located beneath the open enlarged end of the hood 1; then the chimney of the lamp is to
 70 be placed in proper position within said hood, so as to direct the heat upward, and then the lamp should be lighted, by removing said chimney, or the lamp may be lighted before swinging it into such position. The heat
 75 from the lamp rises and if the temperature of the interior of the incubator is below 102°, or below the desired temperature, the valve 21 remains closed as shown, thereby preventing a discharge of heat past said valve, and
 80 causing said heat to pass upward into the adjacent branch 16 of the hood and into the incubator by way of the elbow 17 and pipe 18, the inner end of said pipe being constructed in any known manner to permit passage of
 85 heat therethrough, and heat will pass into the incubator until the temperature rises above the desired temperature, when the expansion device or rod upon the interior of the incubator will exert a pull upon the rod 13 and
 90 the levers 27 and 28 and upon the connecting rod 35, and this movement will be communicated to the arm 23, the valve shaft 19 and the valve 21, and said valve will be correspondingly thrown upward so as to open more
 95 or less the upper end of the branch 15 of the said hood, and permitting the heat from the lamp to pass directly up in a vertical line from the lamp and out of said branch to the atmosphere, exterior of the incubator, instead
 100 of passing through the branch 16 in the manner previously described, thereby retaining as near as possible a fixed temperature upon the interior of the incubator, the heat from the lamp passing thus partially through both
 105 branches of the hood, or alternately through said branches, as the temperature of the incubator may require.

What I claim is—

1. In an incubator the combination of a
 110 thermostat, a valve and connections with a vertical hood 1 having an open lower end 2 which is supported in position closely adjacent one side or end of the incubator, braces
 4 and 5 having their outer ends extending
 115 to said hood and their inner ends secured to said incubator, said braces having vertically aligned bearings 10 and 11, an L-shaped arm 9, the vertical body of which is loosely located in the bearings of said braces, a lamp
 120 supporting ring 8 carried by the free outer end of said L-shaped arm, so as to be swung around directly beneath the open end of said hood and removed from said position by movement of said arm in said bearings, the upper
 125 portion of this arm being provided with screw threads 12, and a nut 13 engaging said screw threads above said brace 4, so that said lamp ring may be vertically adjusted, substantially as and for the purpose herein specified.
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2. The improved heat regulator for incubators, constructed with a vertical hood 1 having an open lower end 2 which is of greater diameter than its upper end, the upper por-

tion of the hood having two separate branches 15 and 16, braces or brackets which secure said hood in position adjacent an incubator, the branch 15 having an open upper end and
5 the branch 16 being shorter than the branch 15, an elbow 17 and a pipe 18 for connecting the branch 16 to the interior of the incubator, a series of compound levers arranged to be connected to an expansion device interior
10 of the incubator, a horizontal pin or shaft 19 mounted in bearings adjacent the upper end of the branch 15, said bearings being located opposite but to one side of the center of the bore of said branch, a valve 21 adapted to
15 close and open the upper end of said branch 15 and fixed upon said shaft in said branch,

one end of said shaft projecting upon the exterior of said branch, a downwardly projecting arm 23 and a counterbalance weight 24 fixed upon said projecting portion of said
20 shaft and extending at an angle to each other, so that the weight of said valve will preponderate, and a connecting rod 35 which connects said arm 23 to said series of compound
25 levers exterior of the incubator walls, substantially as herein specified.

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

JOHN W. JACOBY.

Witnesses:

E. E. LONGAN,
JNO. C. HIGDON.