

(No Model.)

C. B. EDDY.

INCUBATOR.

No. 355,684.

Patented Jan. 11, 1887.

Fig:1.

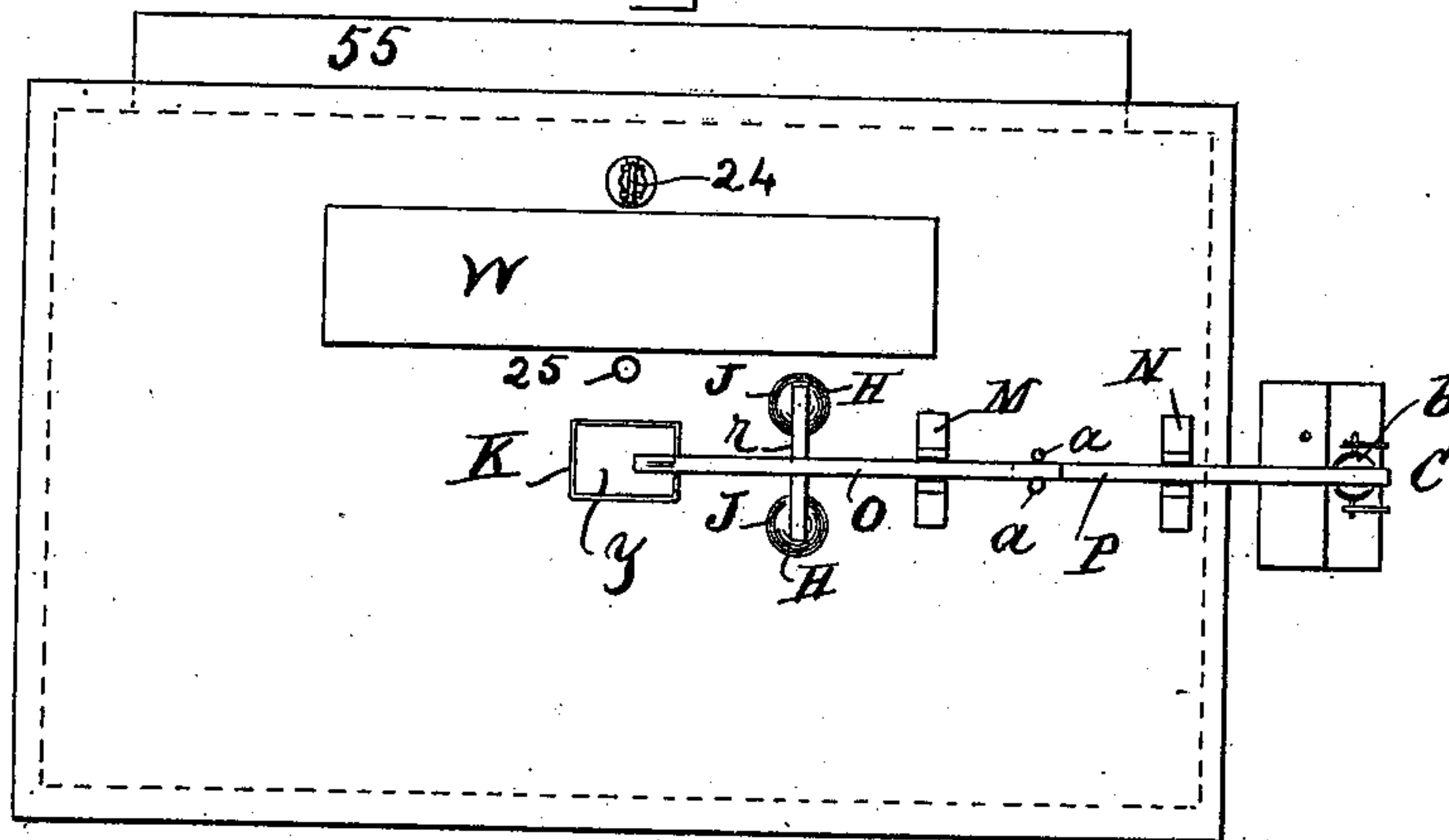


Fig. 2.

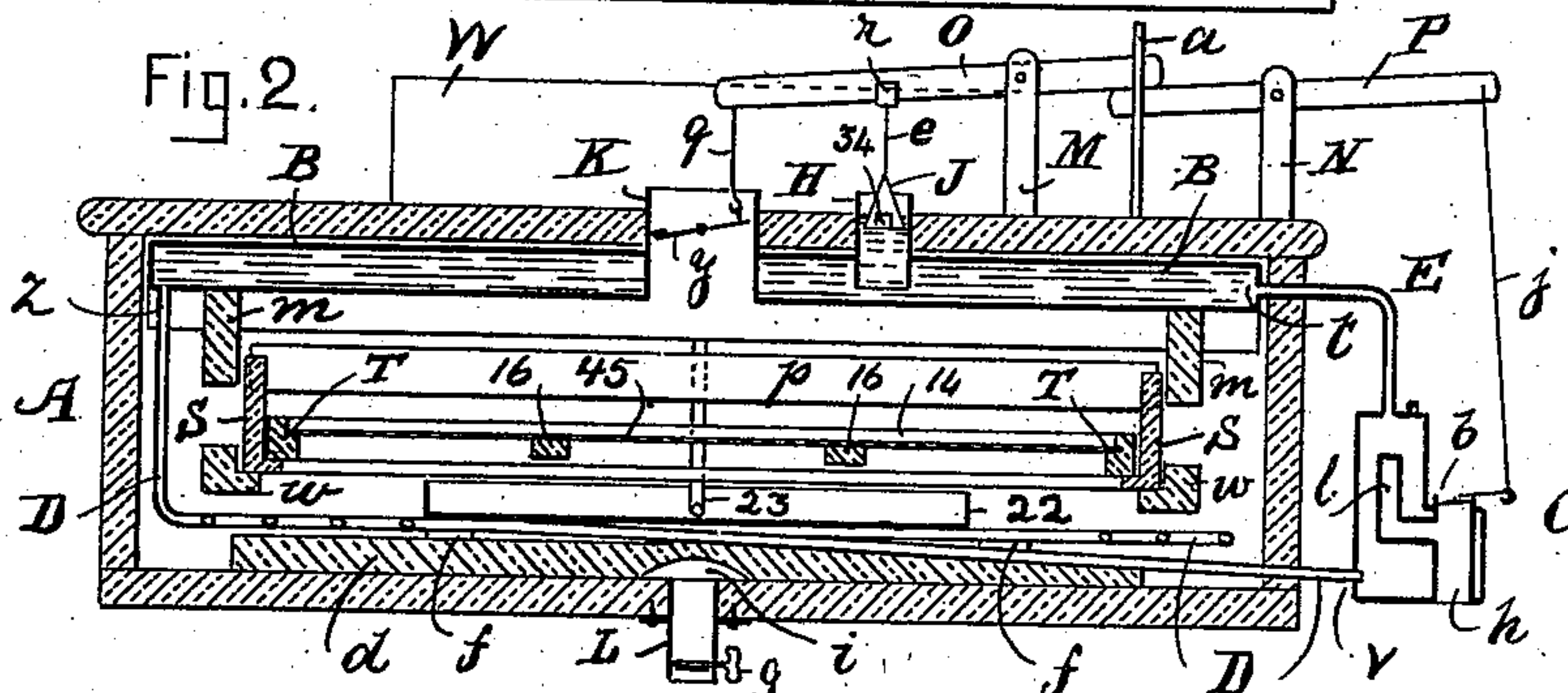


Fig:3.

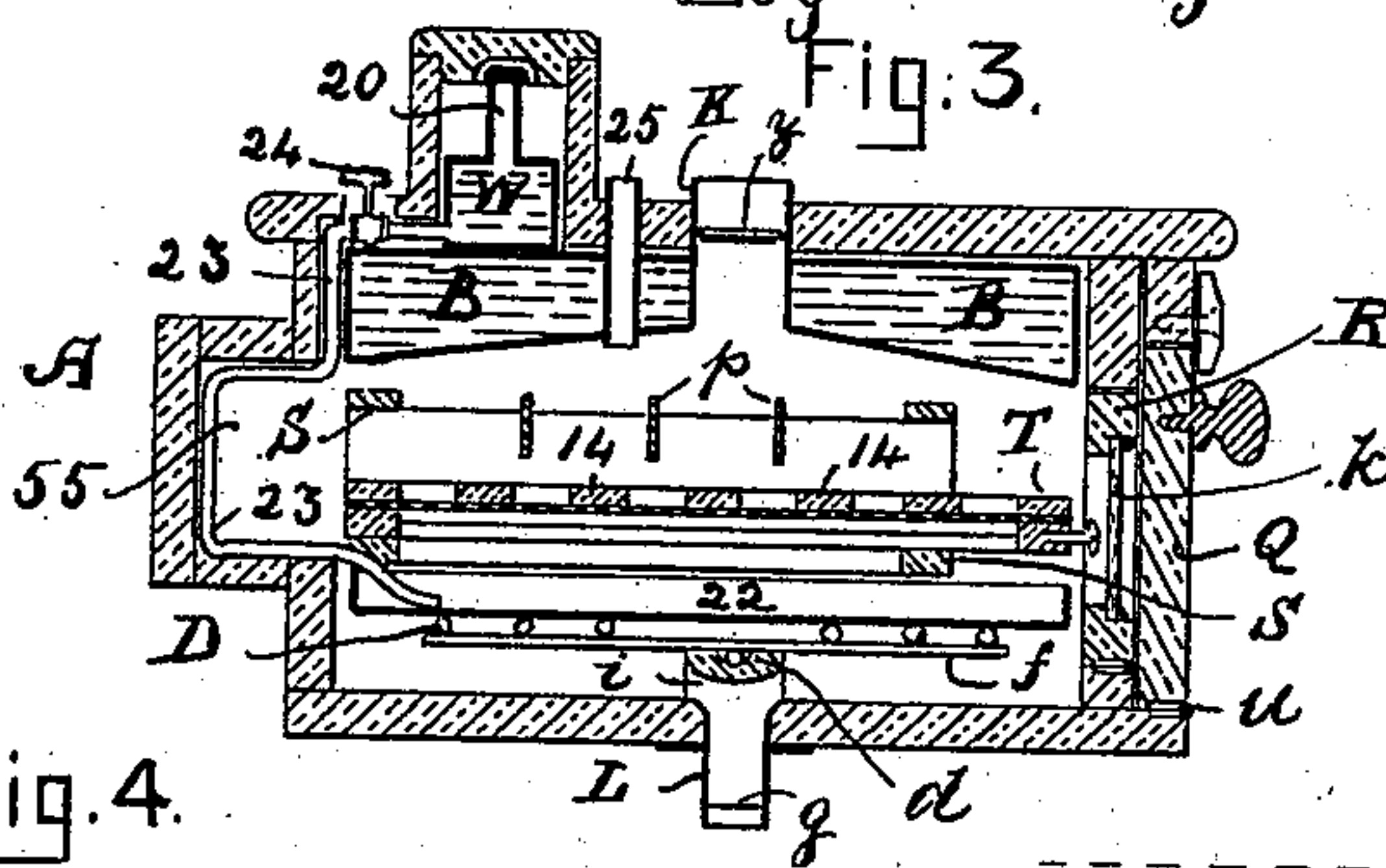


Fig. 4.

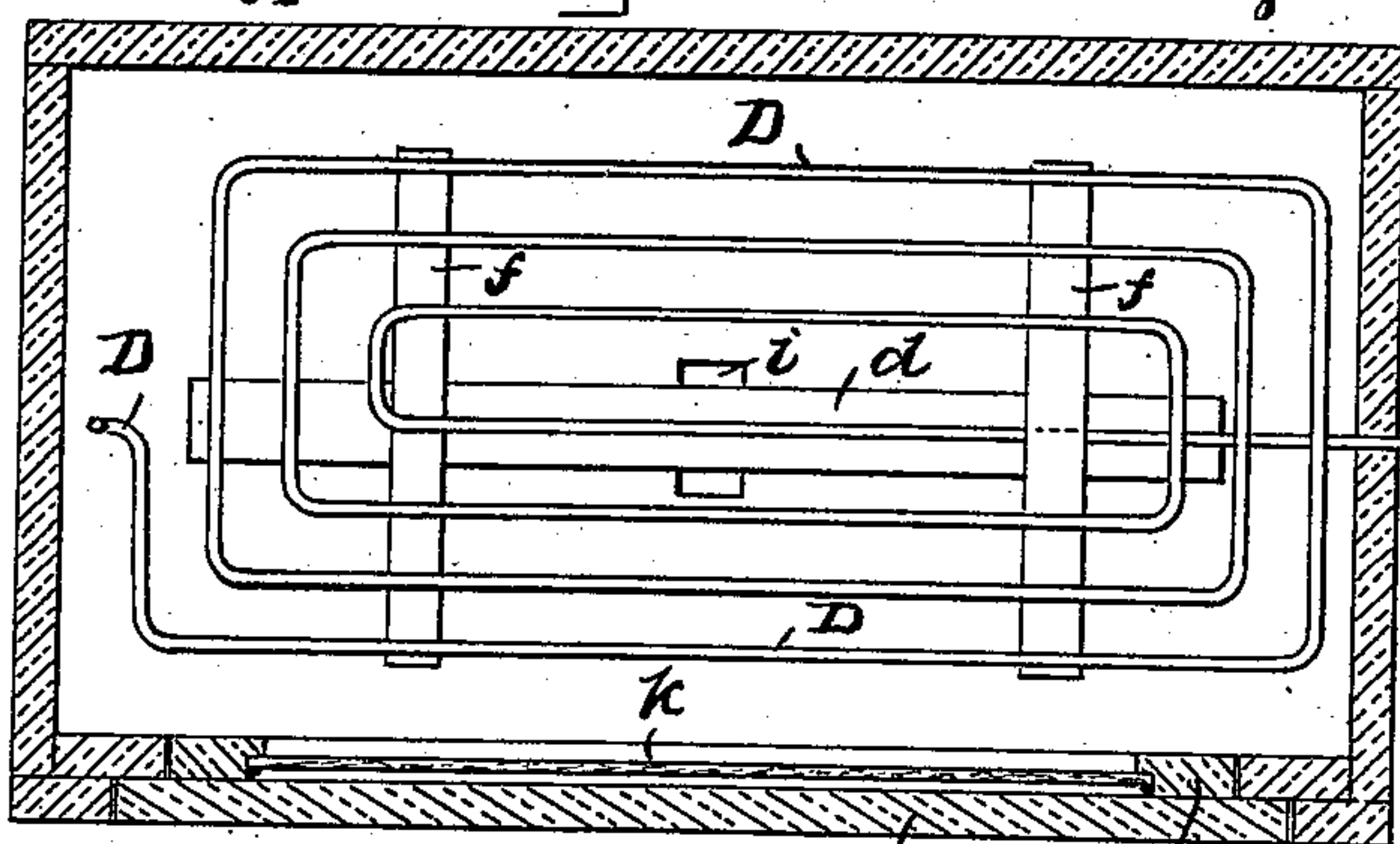


Fig. 5.

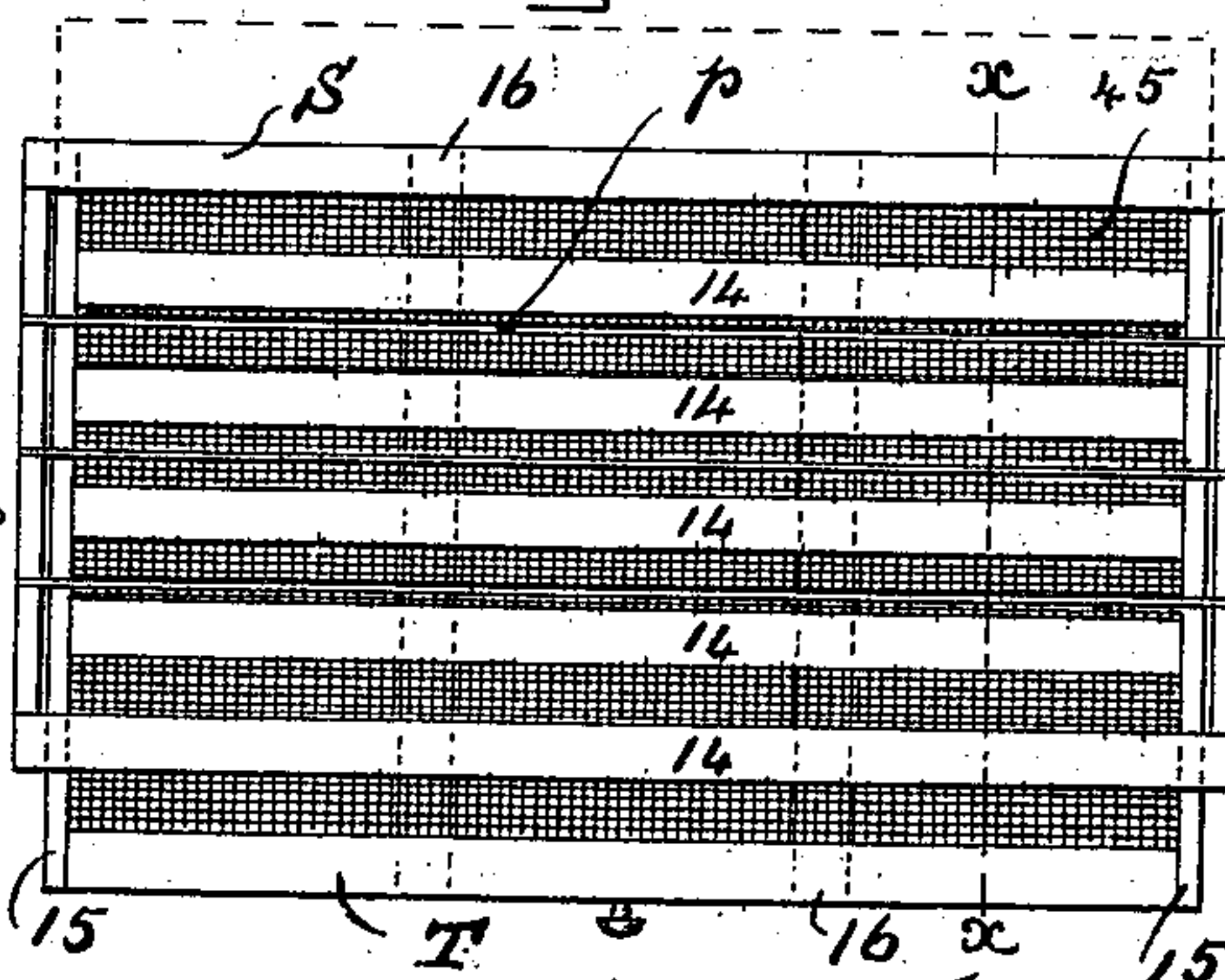


Fig. 6.



Witnesses.

6. Blanta.

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UNITED STATES PATENT OFFICE.

CHARLES B. EDDY, OF GROTON, MASSACHUSETTS.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 355,684, dated January 11, 1887.

Application filed April 9, 1886. Serial No. 192,332. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. EDDY, of Groton, in the county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Incubators, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view of my improved incubator; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a vertical transverse section; Fig. 4, a horizontal section showing a plan of the coiled heating-pipes; Fig. 5, a plan view of the "turner" and "carrier" detached, and Fig. 6 a vertical section taken on line $x x$ in Fig. 5.

Like letters and figures of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of incubators in which the heat is maintained in the hatching-chamber by means of hot water; and it consists in the novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, the object being to produce a more convenient and effective device of this character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the body of the incubator, which is rectangular in form, and may be made of any size, in accordance with the number of eggs it is required to contain. Disposed in the upper portion of the body there is a hot-water tank, B, which may be composed of tin, copper, zinc, or any other suitable material. This tank rests on brackets m , which pass from the front to the rear of the body; but it may be supported in any convenient and substantial manner, and may also be of any suitable size. A closed boiler or heating apparatus, C, is disposed on the outer side of but conveniently near the body A, and leading from the top of said boiler into said tank at t there is an induction-pipe, E. An eduction-

pipe, D, leads out of the tank B at z , and enters the bottom of the boiler C at v , said pipe being coiled in the interior of the body A, as best seen in Fig. 4, and the coils supported on the bars f d . The bar d extends longitudinally of the box A and rests upon the bottom thereof. Upon this bar are supported, at right angles thereto, two or more strips, f , and upon the latter rest the coils, as above mentioned. By this construction and arrangement of the devices for supporting the coils the latter are remote from the sides or bottom of the box, and the air in the box, having a free circulation around and on all sides of the coils, is better and more evenly heated thereby.

The boiler C has a flue, h , which extends vertically through the front portion of its body, and is provided at its upper end with an ordinary centrally-pivoted damper, b , and opening laterally out of the flue h into the body of the boiler there is a hot-air chamber, l , as shown in Fig. 2.

Opening vertically into the tank B through its top and through the top of the body A there are twin tubes, H, each provided with a float, J. A vertically-arranged ventilating-tube, K, also passes centrally through the top of the body A, and through the tank B into the interior of said body, said tube being provided with an ordinary centrally-pivoted damper, y . There is also a vertically-arranged ventilating-tube, L, which opens at i through the bottom of the body A, beneath the bar d , said last-named tube being provided with an ordinary centrally-pivoted damper, g .

Erected on the body A there are two standards, M N, a horizontally-arranged lever, O, being pivoted in the standard M, and a corresponding lever, P, in the standard N. The inner end of the lever O is connected by a rod, q , with the damper y in the ventilator K, and its outer end mounted on the inner end of the lever P between vertically-arranged guides a .

A cross-bar, r , is secured to the lever O midway between the standard M and ventilator K, the floats J being suspended from said cross-bar by rigid rods e , which are jointed to said bar. The outer end of the lever P is connected to the damper b in the boiler C by a rod, j , its inner end extending beneath the outer end of the lever O between the guides a .

The body A is provided at its front side with an outer door, Q, which is hinged at its lower edge, and an inner door, R, hinged in like manner and provided with a glazed opening, *h*.

A frame-work, S, which, for convenience of reference, I denominate the "turner," is arranged horizontally within the body A, and fitted to slide laterally of said body on the ways *w*, said turner being introduced through the doors Q R. An auxiliary frame-work, T, which, for convenience of reference, I denominate the "carrier," is arranged horizontally within the turner and fitted to slide laterally thereof, the turner being open at the front and rear to permit the carrier to be withdrawn from or pushed through the same, as shown in Fig. 5. A series of long thin metallic strips, *p*, arranged edgewise at regular intervals, are framed into the upper portions of the end pieces of the turner S, said strips extending lengthwise of the turner, and being sufficiently far apart to permit the eggs to pass between them.

The bottom of the carrier T is reticulated, consisting of a piece of wire-cloth, 45, over which are disposed a series of thin longitudinally-arranged slats, 14, said slats being placed at regular intervals and supported by the end pieces, 15, and cross-bars 16.

A reservoir or warm-water tank, W, provided with a capped filling-tube, 20, is disposed on the tank B, the body A being so formed as to incase said reservoir and protect it from injury. The water in the tank W is warmed by the heat from the tank B.

Disposed on the coils of the pipe D beneath the turner S there is an evaporating-pan, 22, and leading from the reservoir W into said pan there is an open-mouthed drip-pipe, 23, for supplying said pan with water, said pipe being provided with a stop-cock, 24.

A small auxiliary ventilating-pipe, 25, extends vertically through the top of the body A, and through the tank B into the interior of said body, said last-named pipe being designed to remain constantly open.

In the use of my improvement the carrier T is inserted in the turner S and the eggs to be hatched placed in rows between the slats 14, each egg being supported by the wire-cloth bottom 45, and the rows of eggs arranged between the strips *p* of said turner. The turner and carrier are then inserted in the body A and the doors R Q closed. The tanks W B and boiler C being first filled with water, the stop-cock 24 is opened to let water into the pan 22, and a lighted lamp, of any suitable construction for the purpose, placed under the flue *h* in the boiler C. As the water in the boiler becomes heated it will be caused to circulate through the pipe E, tank B, and pipe D, thereby heating the air in the body A. The tank B is filled to such an extent as to partially submerge the floats J in the tubes H, and as each of said floats is provided with a downwardly-opening air-chamber, 34, when the water in the tank B and pipe D becomes hot enough to raise the temperature of the air

in the interior of the body A above 104° Fahrenheit, or higher than is necessary for hatching the eggs, the air in said chamber 34 is expanded, thereby raising said floats, elevating the inner arm of the lever O and outer arm of the lever P, and simultaneously opening the damper *b* in the boiler C and damper *y* in the ventilator K, thus automatically regulating the temperature within the body A in a manner which will be readily obvious without a more explicit description.

It will be obvious that when the damper *b* is opened in the boiler C the heated air in the flue *h* will pass directly out of the boiler, instead of into the chamber *h*, thus tending to rapidly reduce the temperature of the water in the boiler and tank B.

In filling the boiler and tank the water is poured into the tank through the tubes H and passes into the boiler through one or both of the pipes E D. The tank and boiler may, however, be filled through a separate pipe designed for that purpose, if preferred, or in any other convenient manner.

The ventilator L is designed to be set in accordance with the temperature of the surrounding atmosphere.

Instead of the boiler C, any other suitable boiler may be employed, if preferred.

The eggs on the carrier T should be turned once or twice a day during incubation, and this may be accomplished by sliding the carrier in the turner S, thereby bringing the eggs into contact with the strips *p*, and causing them to revolve or be turned in accordance with the distance the carrier is moved.

The carrier is preferably made an inch or two wider than the turner, as shown in Figs. 3 and 5, and in order to enable it to be pushed through the turner sufficiently to turn the eggs an elongated chamber, 55, is formed at the rear of the body A to receive the rear side of the carrier, as best seen in Fig. 3, in which the carrier is represented as withdrawn to nearly the fullest extent possible when the turner and carrier are in position for use within the body A.

The evaporating-pan 22 being disposed immediately over the coil of hot-water pipes D, the water contained therein will be readily evaporated and supply the moisture requisite in hatching the eggs.

The glazed door R enables the eggs to be examined without opening the door, and thereby cooling the interior of the incubator.

One of the floats J may be dispensed with, if desired, in which case the other, in order to work to the best advantage, should be of proper size to operate the lever, O, disposed beneath said lever.

I do not confine myself to the use of the lever P, as said lever and the rod *j* may be dispensed with and the damper *b* regulated by other means, in which case the floats will operate to regulate the ventilating-damper *y* only. Neither do I confine myself to constructing the float J with the downwardly-opening air-

chamber 34, as this may be omitted, the float being raised by the expansive action of the heated water, although I deem it preferable to use said air-chamber, as it renders the float
5 more sensitive.

The reservoir W and pipe 23 may also be omitted and other means for supplying the evaporating-pan with water employed, although I deem the reservoir and pipe very desirable, as they serve to supply the pan with
10 water automatically and in proper quantities.

I am aware that it is not new, broadly, to provide an incubator with a movable egg-turner adapted to slide across the egg-carrier
15 for turning the eggs therein, and do not claim the same, broadly.

Having thus explained my invention, what I claim is—

1. In an incubator having a ventilator, hot-water tank, boiler, and pipes connecting the tank and boiler, the pivoted levers O P, float J, and dampers *y b*, combined and arranged to operate substantially as and for the purpose described.

2. In an incubator, the turner S, narrower than the body of the incubator, said turner comprising an upper and a lower section, the upper section being provided with downwardly-projecting transverse strips *p*, in combination with the carrier T, supported by said
25 turner between the upper and lower sections thereof, substantially as described.

CHARLES B. EDDY.

Witnesses:

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