

No. 664,657.

Patented Dec. 25, 1900.

J. L. MACY.
INCUBATOR.

(Application filed May 3, 1898.)

(No Model.)

3 Sheets—Sheet 1.

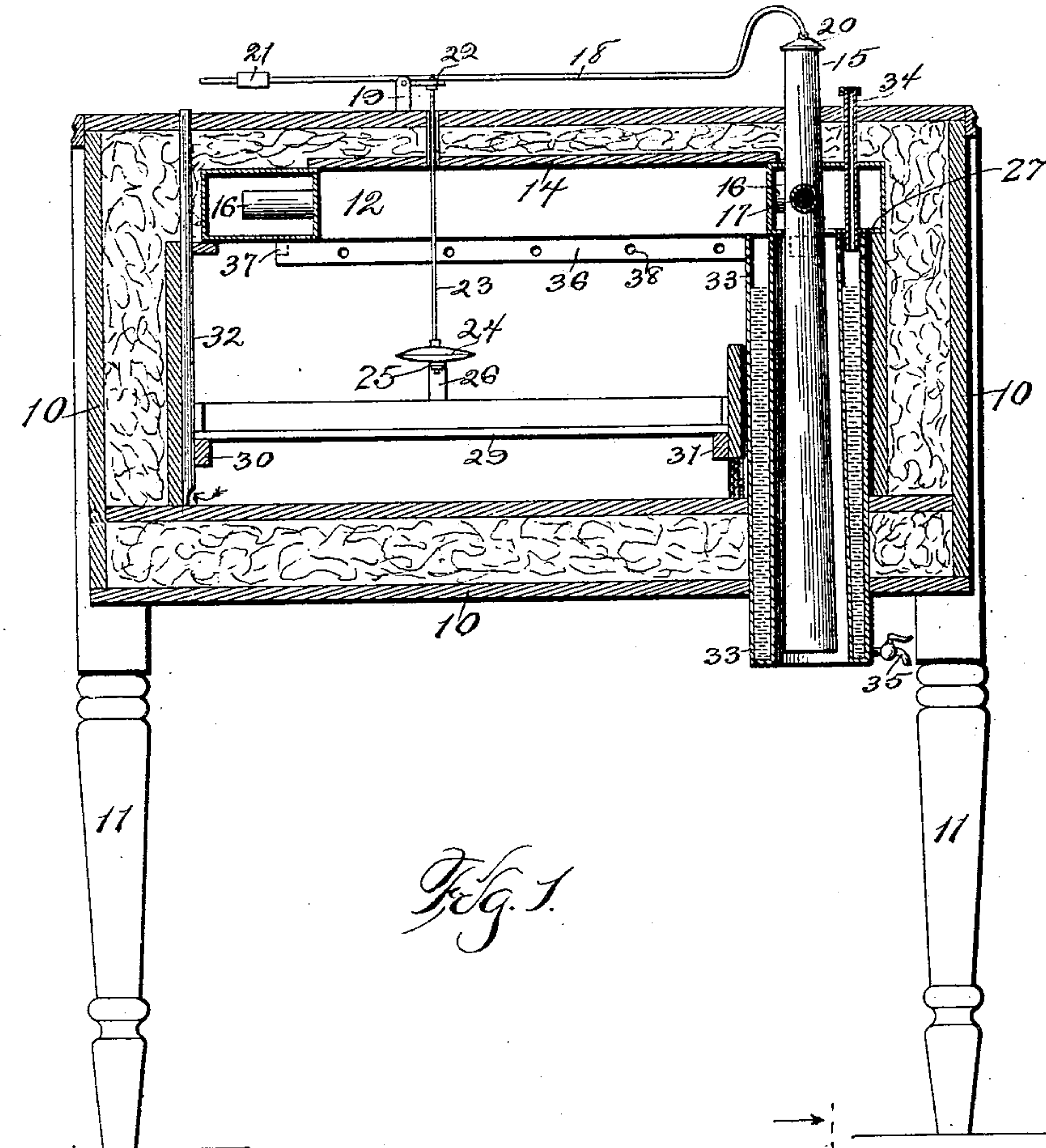
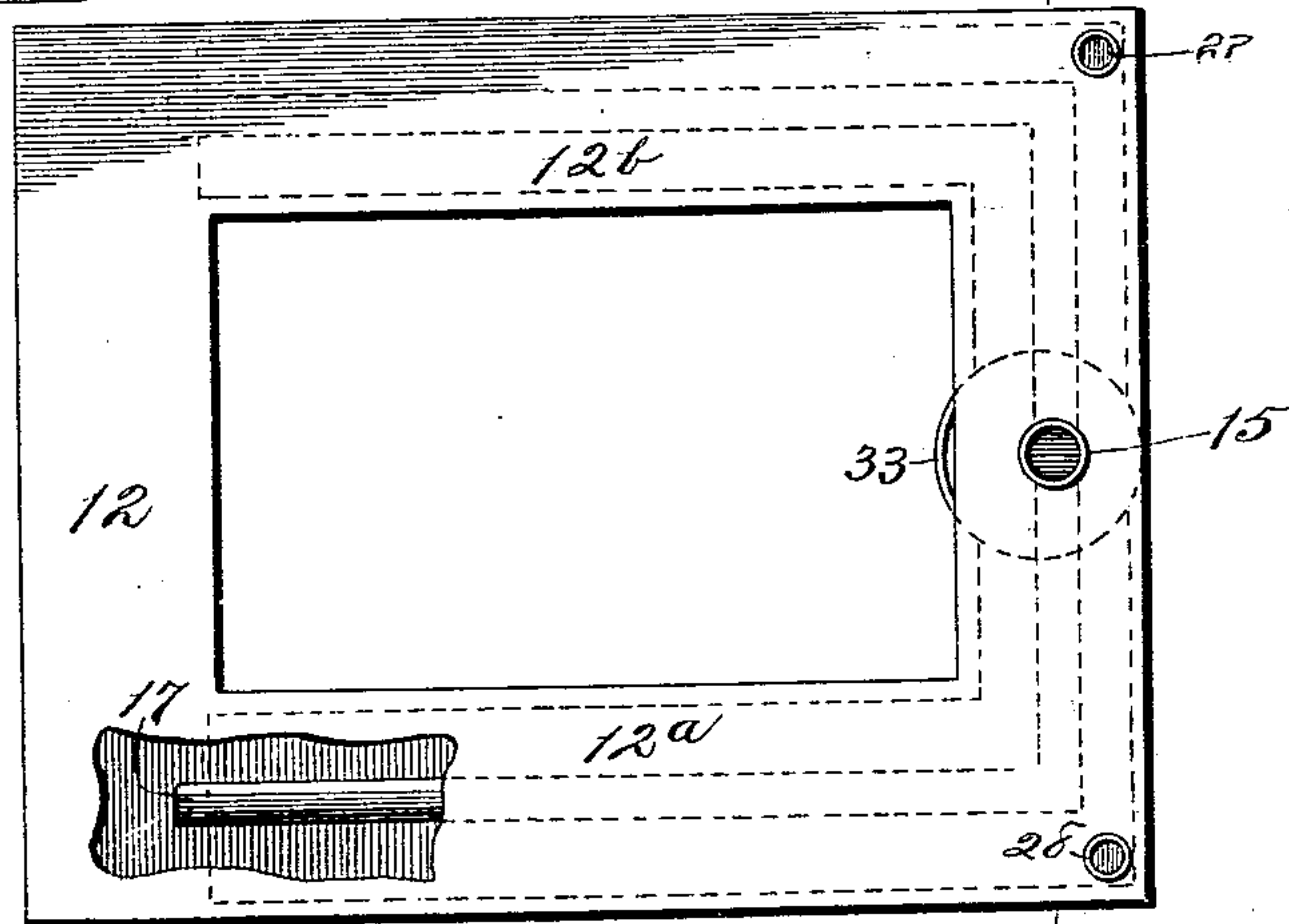


Fig. 1.

Fig. 2.



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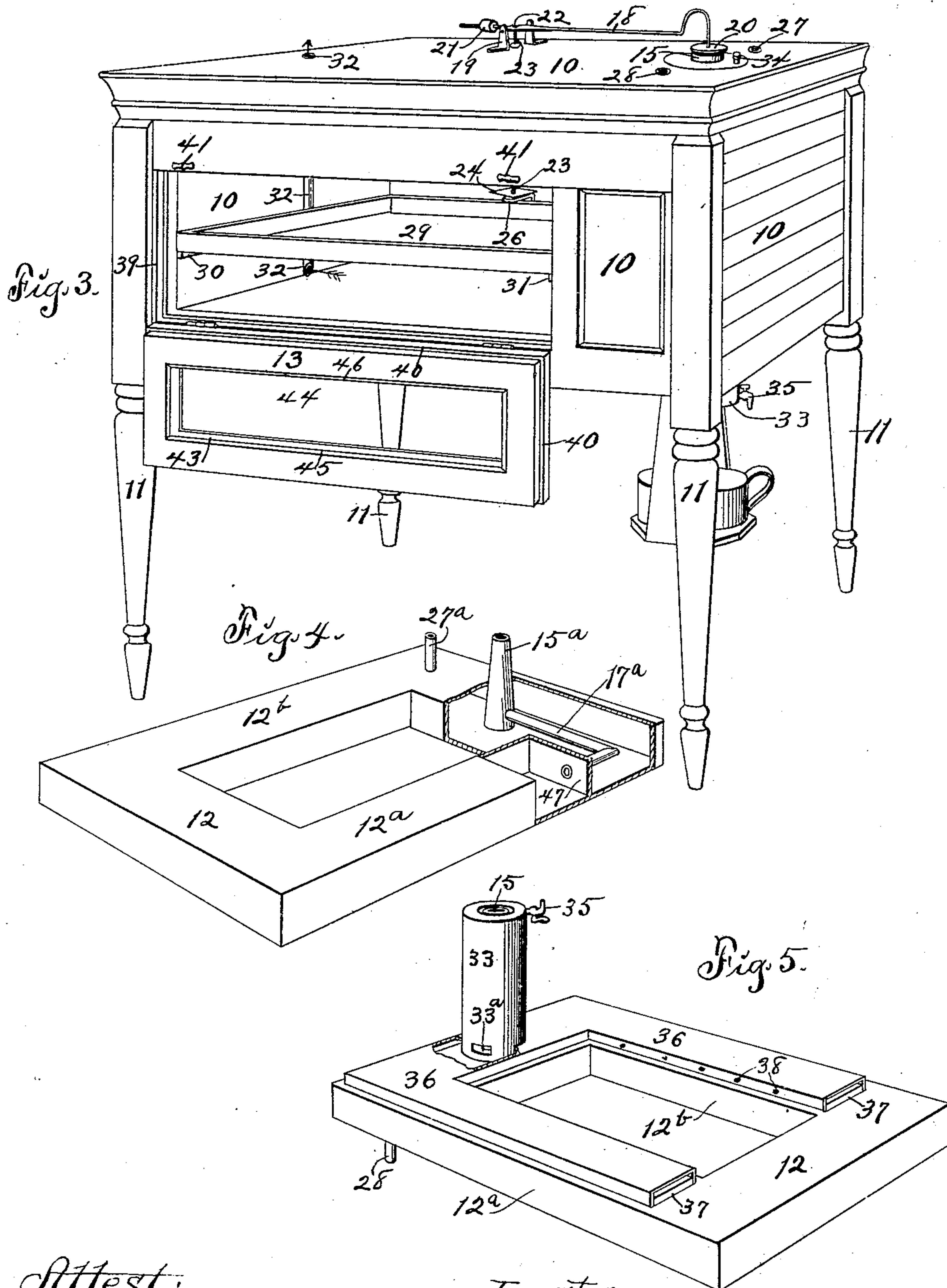
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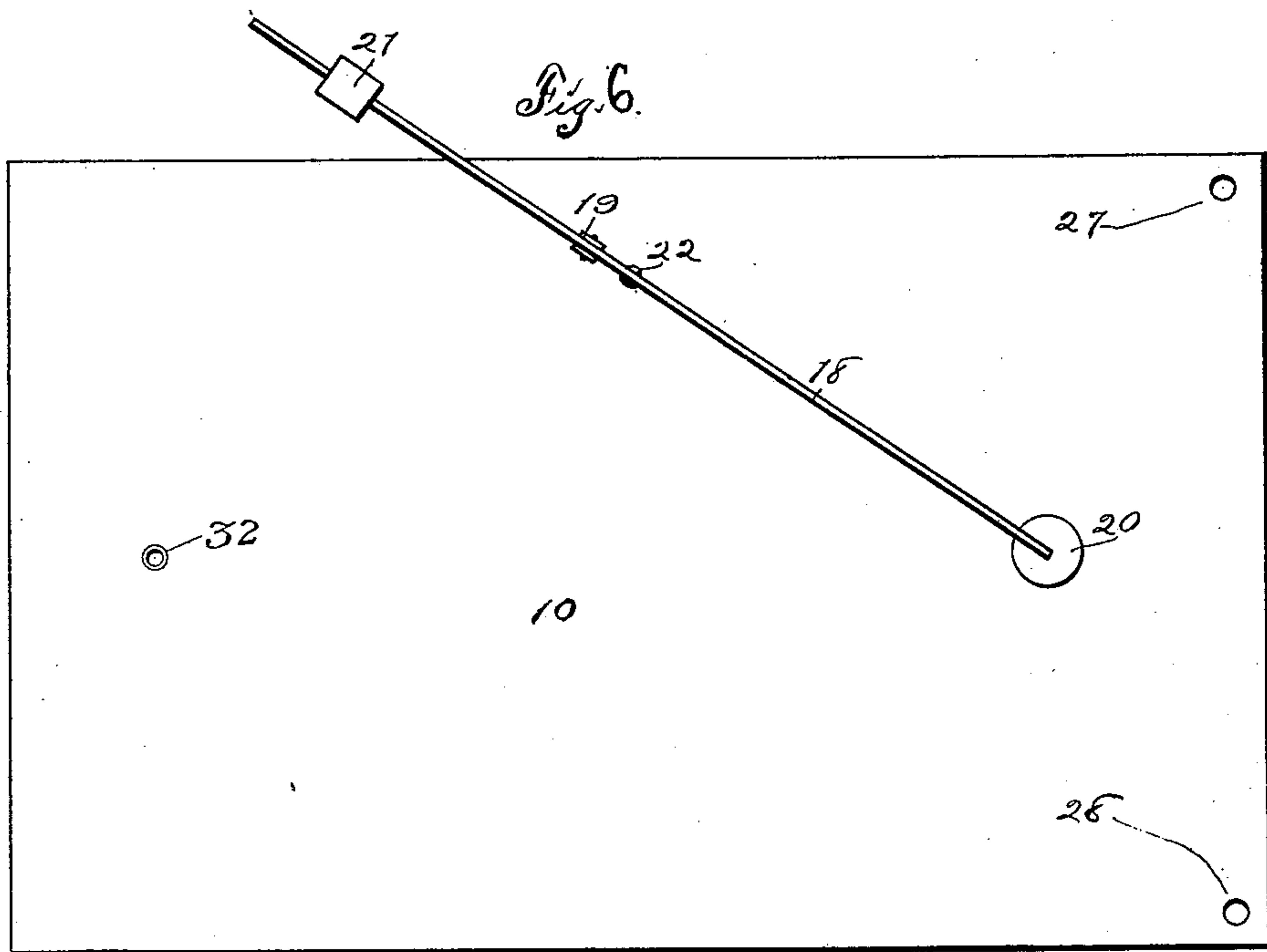
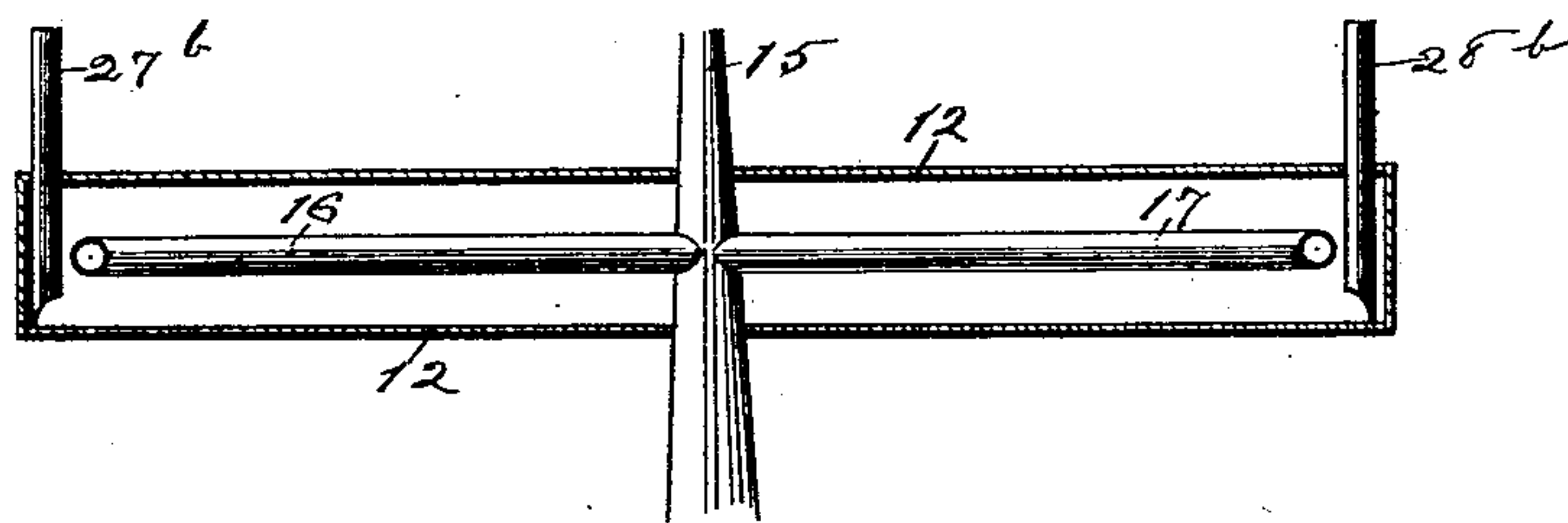


Fig. 7.



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UNITED STATES PATENT OFFICE.

JETHRO L. MACY, OF DES MOINES, IOWA.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 664,657, dated December 25, 1900.

Application filed May 3, 1898. Serial No. 679,598. (No model.)

To all whom it may concern:

Be it known that I, JETHRO L. MACY, a citizen of the United States of America, and a resident of Des Moines, Polk county, Iowa, have
5 invented certain new and useful Improvements in Incubators, of which the following is a specification.

The object of this invention is to provide improved means for incubating eggs, for controlling the circulation of air within an incubator,
10 for regulating the heat disseminated in an incubator, and for determining and controlling the degree of moisture in an incubator.

My invention consists in the construction, arrangement, and combination of elements
15 hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 illustrates a central vertical longitudinal section of my apparatus. Fig. 2 is a plan, part of the top being broken away, of my improved hot-air tank detached from the apparatus. Fig. 3 is a perspective of the complete apparatus in position for use, the
25 door being open to reveal the interior of the egg-chamber. Fig. 4 is a perspective, partly in section, illustrating a modified form of construction of my improved hot-air tank detached from the apparatus. Fig. 5 is an inverted perspective of the preferred form of hot-air tank and connected devices, partly
30 in section to illustrate the communication between the hot-water tank and the moisture-duct. Fig. 6 is a plan of the complete apparatus. Fig. 7 is a cross-section of the hot-air tank on a line near the chimney and illustrates the relative positions of the chimney, the hot-air pipes communicating therewith, and the vents whereby the used air is discharged from the hot-air tank.
40

In the construction of the apparatus, as shown, the numeral 10 designates the casing, mounted on legs 11. A hot-air tank 12 is horizontally positioned in the upper portion
45 of the casing 10, and a packing of mineral wool is interposed between the top of the tank and the top of the casing. The tank 12 is formed as a hollow rectangle, and the portion 12^a thereof in front of the opening therein is of greater width than the portion 12^b thereof
50 at the rear of the opening and is located ad-

jacent to the door 13 of the incubator. The central opening of the hot-air tank is shown covered by a plate 14, overlapping the edges thereof and parallel with the top of the casing 10; but the plate 14 may be replaced by the top plate of the tank being continued across the center thereof, if desired, or the bottom plate of the tank may be continued across.
55 60

A chimney 15 is positioned vertically in the right end of the casing 10 and traverses, and is soldered to the right end portion of the hot-air tank 12. The chimney 15 projects from the casing at each end. A heating-lamp (not shown) may be located beneath the lower end of the chimney 15 and the upper end of the lamp-chimney extended within the same, as is common in this class of apparatus.
65 70

A hot-air pipe 16 is mounted centrally in and extends longitudinally of the portion 12^b of the tank 12, has its terminal near the left end of the tank, is bent at right angles near the right end of the tank, and communicates at its initial end with the chimney 15. Both ends of the pipe 16 are open. A hot-air pipe 17 is mounted centrally in and extends longitudinally of the portion 12^a of the tank 12, has its terminal near the left end of the tank, is bent at right angles near the right end of the tank, and communicates at its initial end with the chimney 15. Both ends of the pipe 17 are open.
75 80

A regulating-lever 18 is fulcrumed in a stand 19 on the top of the casing 10 and carries a cap 20 on one end and a poise 21 on the other end, the cap resting at times on the upper end of the chimney 15 and rising and falling relative thereto in the oscillation of the lever. A plate 22 is fixed to the lever 18, immediately in front of the fulcrum-point thereof, and an actuating-rod 23 engages said plate at its upper end, extends downwardly therefrom through the top of the casing 10 and central opening of the tank 12, and rests at its lower end in a socket centrally located on the top of a thermostatic cell 24. A bolt 25 is fixed to and extends downwardly from the center of the cell 24 and is secured in an angle-iron bracket 26, fixed to the inner face of the rear wall of the incubator.
85 90 95 100

Openings 27 28 are formed in the right cor-

ners of the top plate of the tank 12, and pipes 27^b 28^b, Fig. 7, are inserted in said openings and communicate with the outer air through the top of the casing 10.

5 An egg-tray 29 is removably and replaceably mounted horizontally on cleats 30 31, positioned transversely of the interior of the incubator.

10 A ventilating-pipe 32 is positioned vertically and countersunk in the left end of the incubator-chamber and extends from the bottom thereof at the left of the egg-tray and hot-air tank through the top of the casing 10. The pipe 32 is chamfered at its lower end to
15 provide an opening at the bottom of the chamber to receive the discharging air therefrom.

An annular tank 33 is located in the right end of the incubator, approximately concentric with and spaced apart from the chimney
20 15, and extends vertically from the bottom of the tank 12 through the bottom of the casing 10. The tank 33 is closed at its bottom, arranged to receive water through a supply-pipe 34, traversing the top of the casing, and
25 discharge the same through a faucet 35. The upper end of the tank 33 abuts the bottom of the hot-air tank 12 and is provided with openings 33^a, one of which is shown in Fig. 5, front and rear, adjacent thereto. The open-
30 ings 33^a in the upper part of the tank 33 communicate with the initial ends of moisture pipes or ducts 36, Fig. 4 and dotted lines Fig. 2, which ducts lead rearwardly and forwardly from the tank 33 along the bottom of
35 the air-tank 12, are bent at right angles and extend along the bottoms of the portions 12^a 12^b of the air-tank, and discharge above the egg-tray 29 near the left end of the incubator-chamber. Cleats 37, dotted lines Fig. 1, are
40 mounted in and transversely of the upper portions of the terminal openings of the ducts 36 to limit and retard the discharge therefrom, and a plurality of perforations or apertures 38 are formed in the adjacent sides of
45 the ducts to discharge moisture into the egg or incubator chamber.

The door 13 of the incubator is formed with a frame rabbeted in its outer edge to fit rabbets formed in the jambs 39, and the joint
50 between the frame or sash and the jambs is packed with a strip 40 of felt, glued to the door-frame. The frame of the door is hinged to the lower jamb, and the upper margin thereof is secured by a turn-button 41 on the
55 upper jamb, a knob 42 being provided on the frame for manual use in opening and closing the door. The door-frame is rabbeted on opposite sides of its inner margins to receive panes of glass 43 44, retained therein in parallel planes by beads or moldings 45 46,
60 tacked to the frame, thus providing a dead-air space or "double" construction with a single door.

In the construction of the air-tank, as shown
65 in Fig. 3, a partition 47 is mounted in the right end of the portion 12^a, and a single pipe 17^a leads from the chimney 15^a and discharges

through said partition, the hot air traversing the tank and escaping through a single vent 27^a at the farthest corner of the tank. 70

In the provision of the central opening in the hot-air tank I provide against overheating the central portion of the incubator-chamber and at the same time supply sufficient heat entirely around and in the outer portions of the chamber, which inevitably finds
75 its way to the center in sufficient and desirable degree.

In the provision of a greater width of the portion of the tank 12 adjacent to the door
80 13 I compensate for possible draft and cold radiation through the door and offset the undesirable effects of opening the door for necessary examination and turning of the eggs.

In the provision of the ventilating-pipe 32,
85 leading from the bottom of the chamber through the top thereof, I insure the perfect and thorough circulation of the moisture-laden air entering from the top of the tank 33.

I am aware that a tank similar to my water-tank 33 heretofore has been employed to
90 supply a hot-water system in incubators heated by the radiation from coils of pipe, and I do not claim such construction.

I claim as my invention— 95

1. In an incubator, the combination of a casing, an egg-tray therein, and a hot-air tank in the upper portion of the casing, which tank is formed with a central opening to lessen the radiating area thereof, a chimney traversing
100 and surrounded by one end portion of the air-tank, pipes 16, 17 leading laterally from the chimney, bent at right angles and extended in parallel planes on opposite sides of the central opening nearly to the opposite end of
105 the air-tank and terminating with open ends within the tank and vent-pipes leading from the air-tank adjacent to the elbows of the pipes 16, 17.

2. A hot-air tank formed as a hollow rectangle, the front side portion of said tank being greater in width than the other, in combination with a casing to receive said tank, a door in the casing, the widest portion of the tank being located adjacent the door, and
115 means for supplying heated air to the tank.

3. In an incubator the combination of the casing, a chamber in the casing, an egg-tray in the casing, a ventilator-pipe in the casing, a hot-air tank in the casing-chamber above
120 the tray, which tank is provided with an aperture vertically in one end portion thereof, a chimney mounted vertically in and extending through the casing-chamber and traversing the aperture in the end portion of the air-tank, pipes affording communication between
125 the chimney and the interior of the air-tank, vent-pipes affording communication between the air-tank and the outside of the casing, a water-tank of annular form surrounding the lower portion of the chimney and depending from the air-tank, the water-tank being open at its top and communicating with the chamber in the casing, a pipe formed on the lower
130

face of the hot-air tank and communicating with the open end of the water-tank and open at its other end within the chamber, which pipe is perforated laterally within the chamber, a thermostat controlling the draft through the chimney and means for heating the water in the water-tank and the air in the chimney.

4. An air-tank for incubators formed as a hollow rectangle, and provided with a vertical aperture near one end to receive a chim-

ney, air-pipes in the tank and communicating at one end each with the chimney and open at the other end within the tank and vent-pipes leading from the tank.

Signed by me at Des Moines, Iowa, this 15
30th day of March, 1898.

JETHRO L. MACY.

Witnesses:

THOMAS G. ORWIG,
S. C. SWEET.