

F. SAUMENIG.
THERMOSTAT FOR INCUBATORS.

No. 433,910.

Patented Aug. 5, 1890.

Fig 1

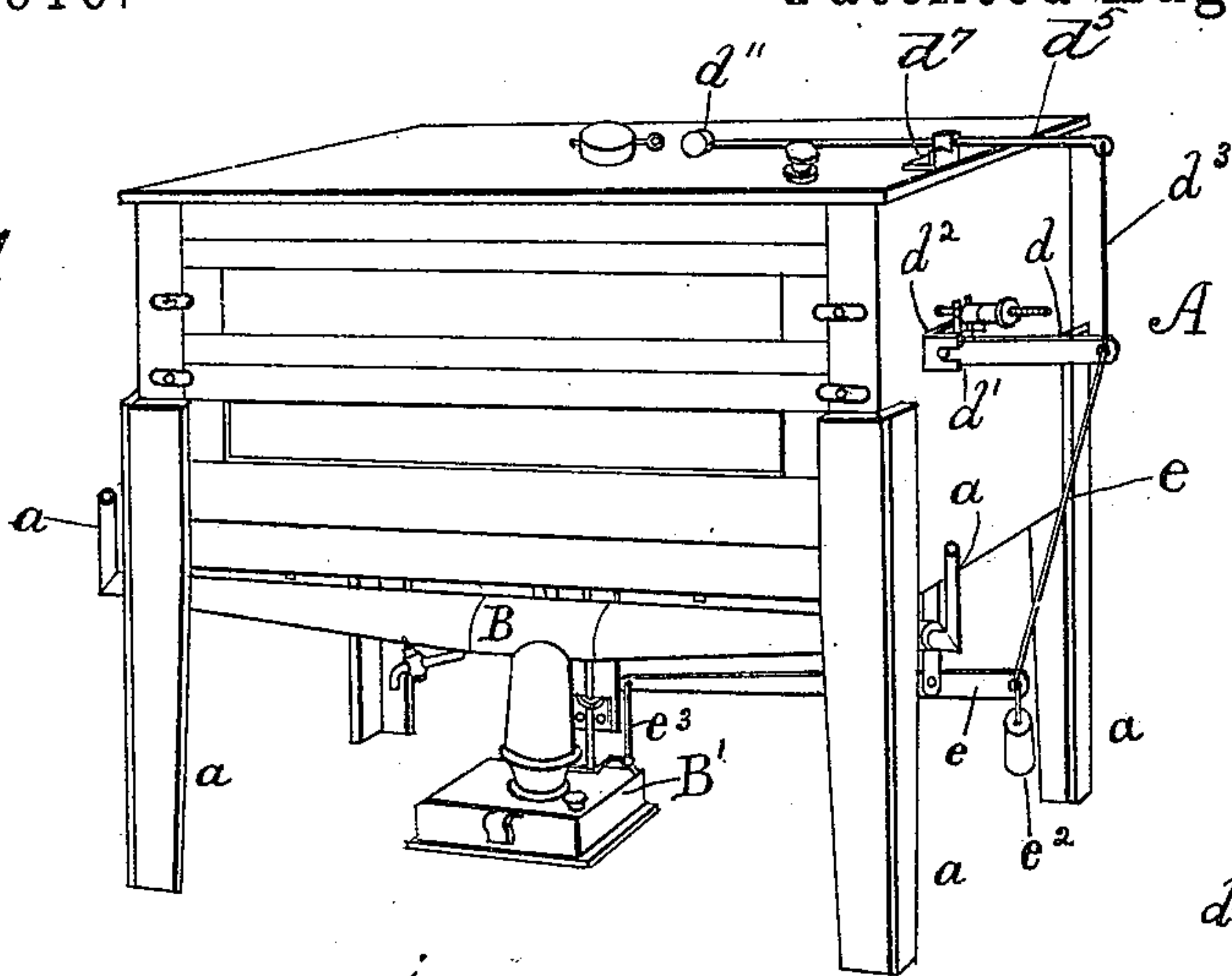


Fig 1^a

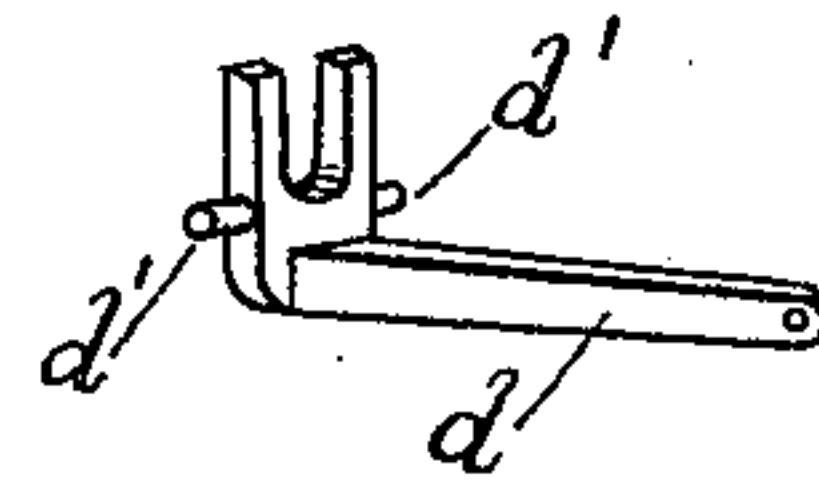


Fig 2

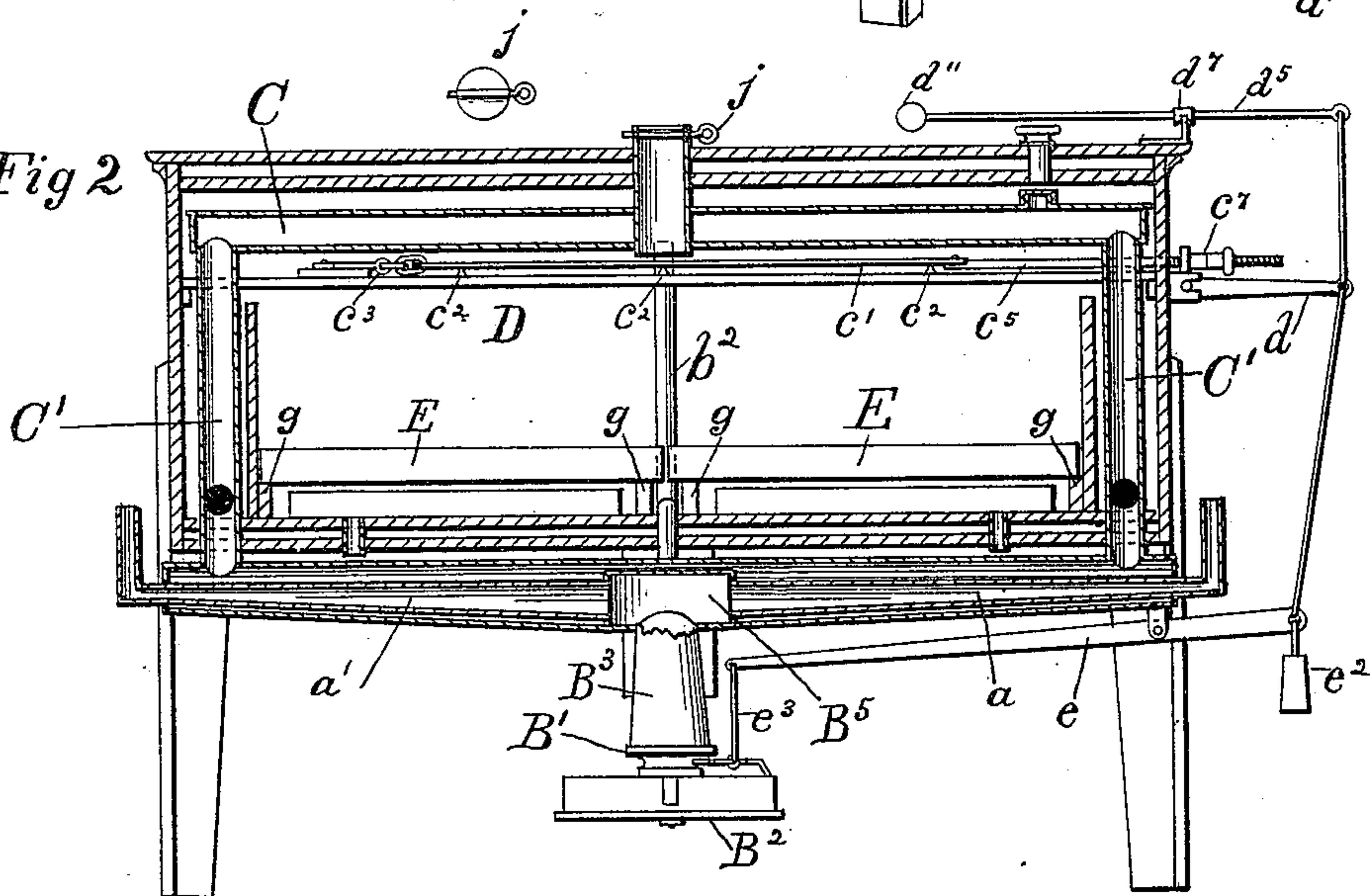


Fig 3

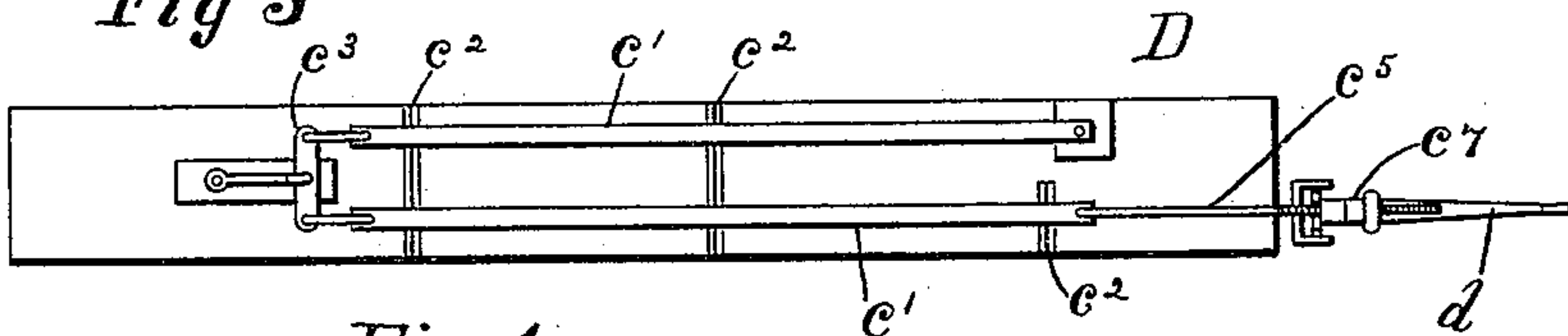
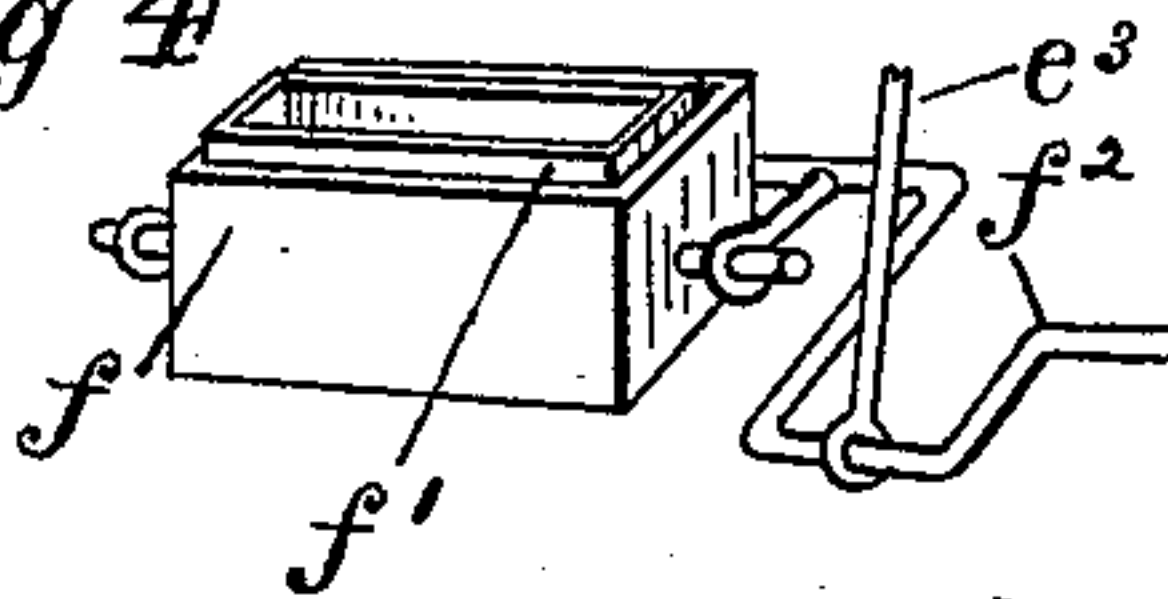


Fig 4



Witnesses
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Chas. Welch.

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By *Paul A. Stetson*

(No Model.)

2 Sheets—Sheet 2.

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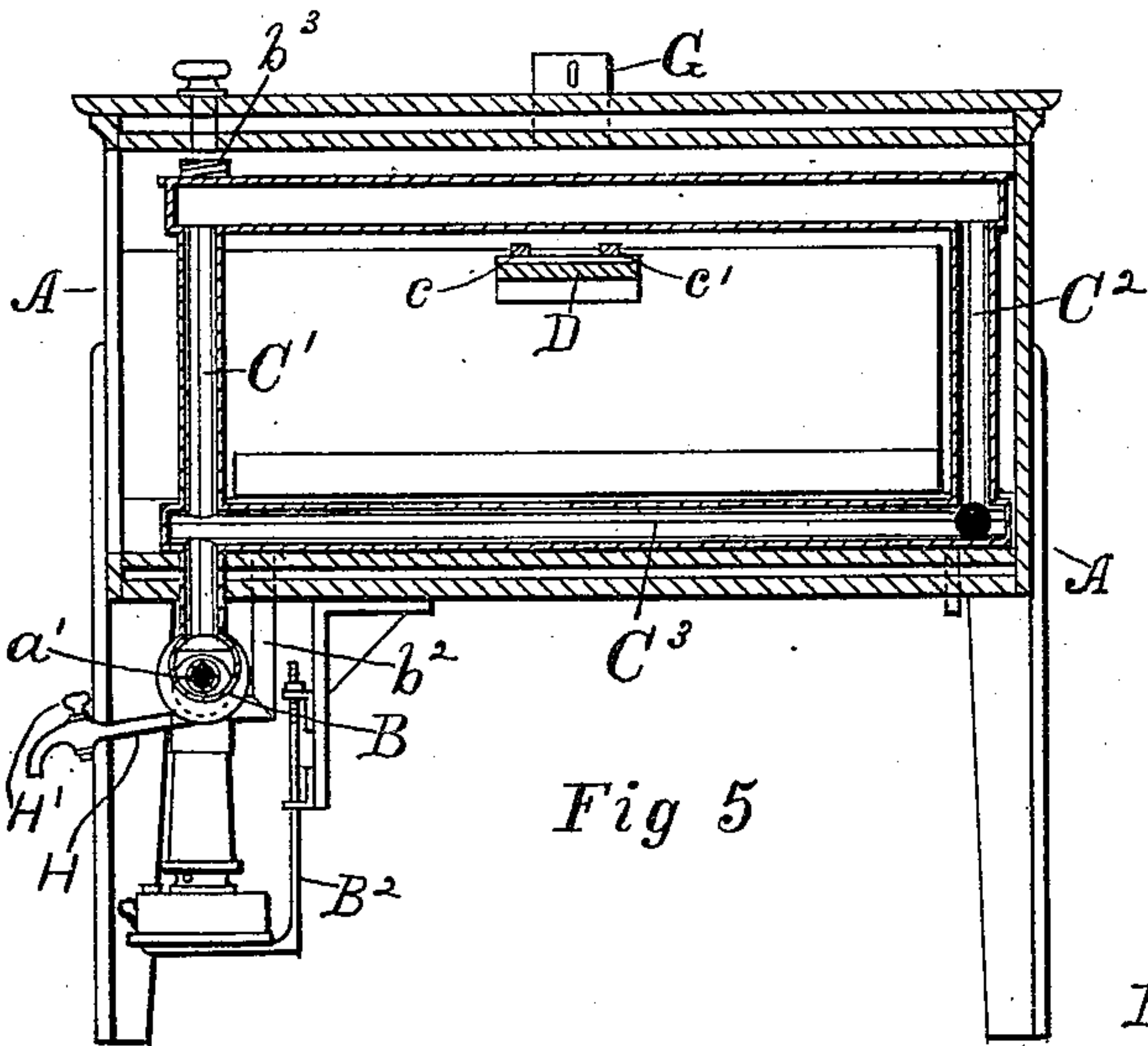


Fig 5

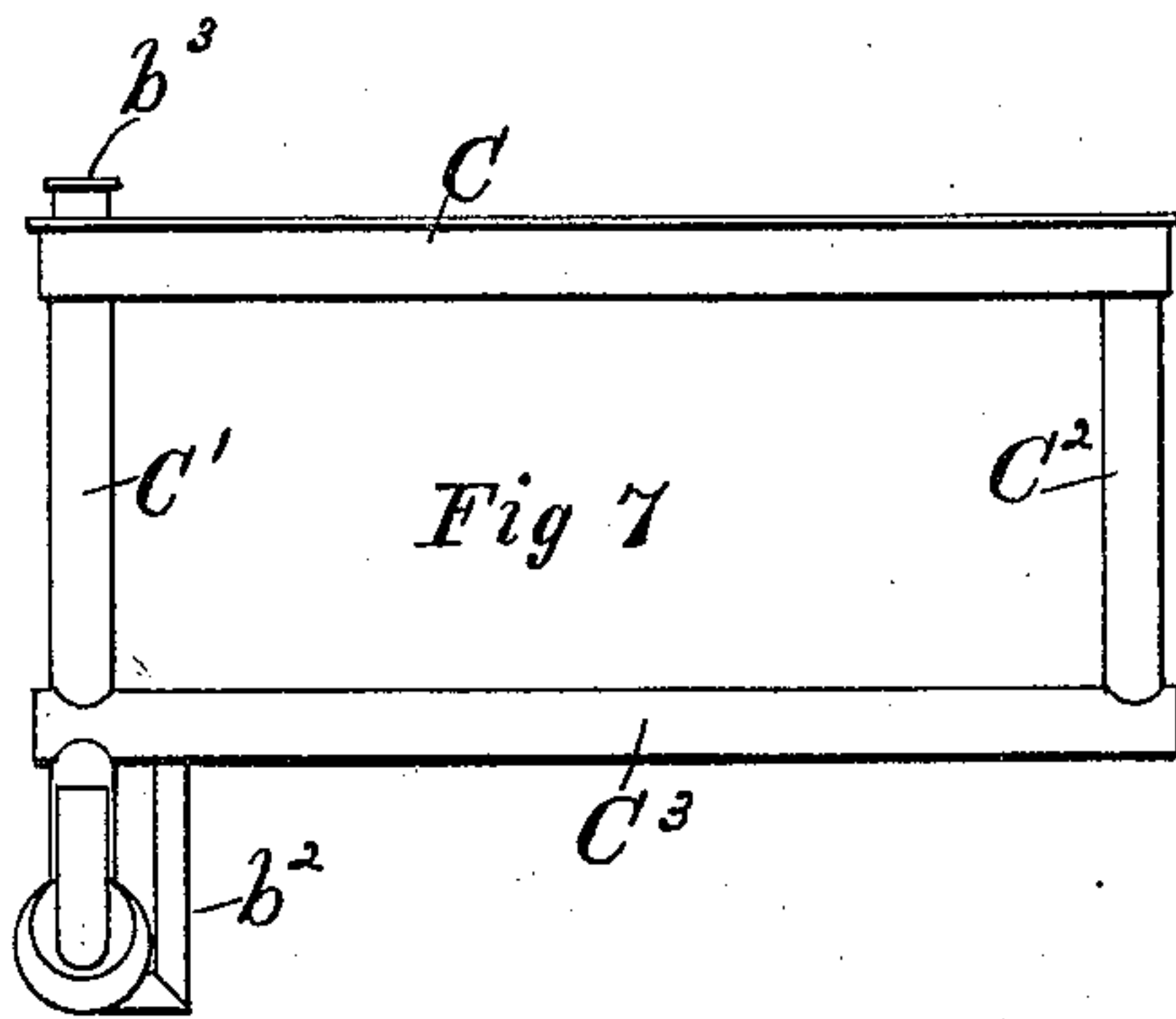


Fig 7

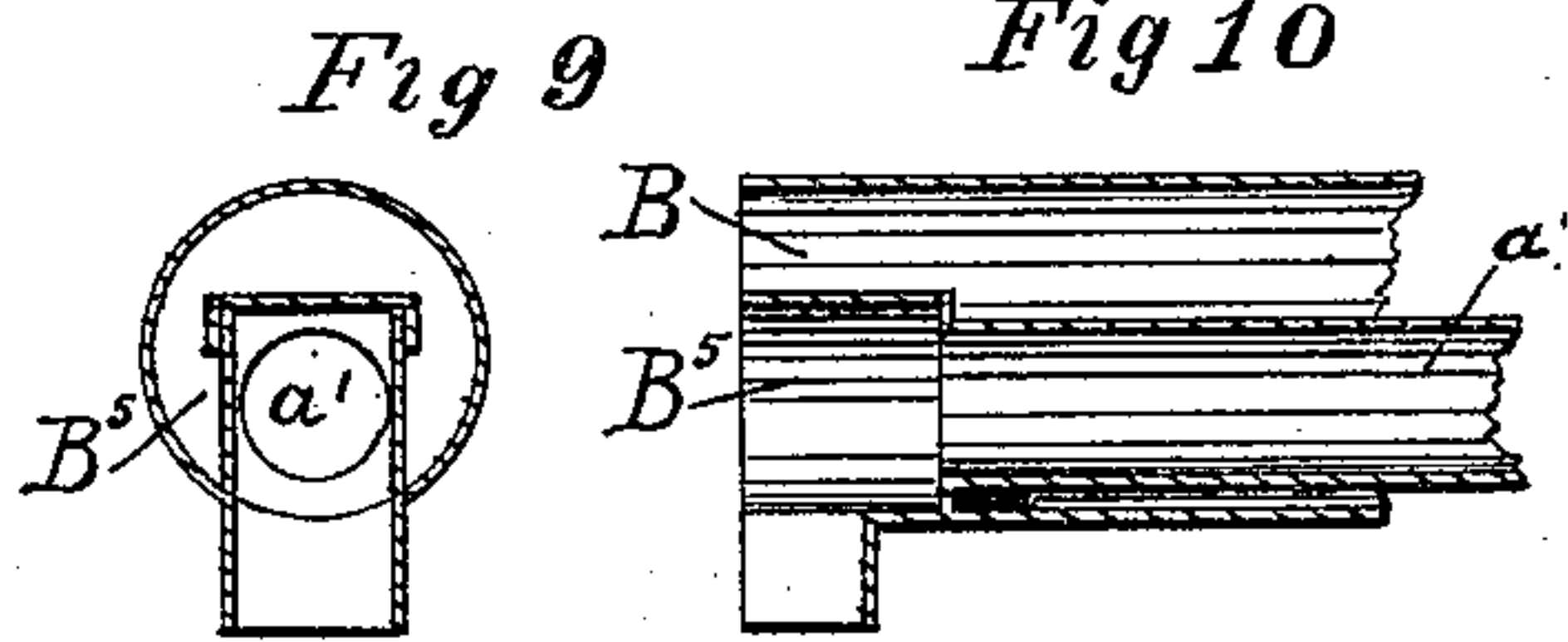


Fig 9

Fig 10

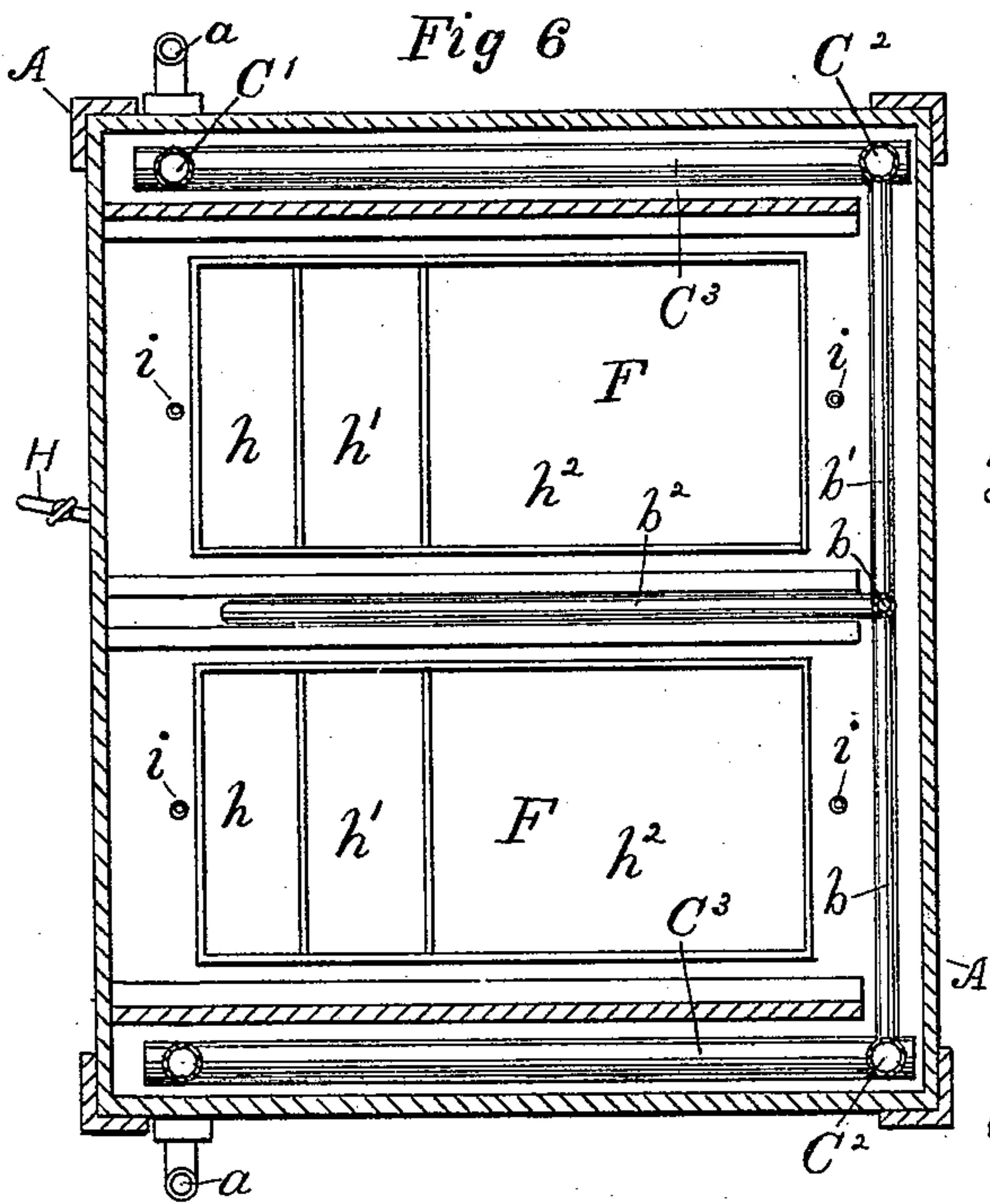


Fig 6

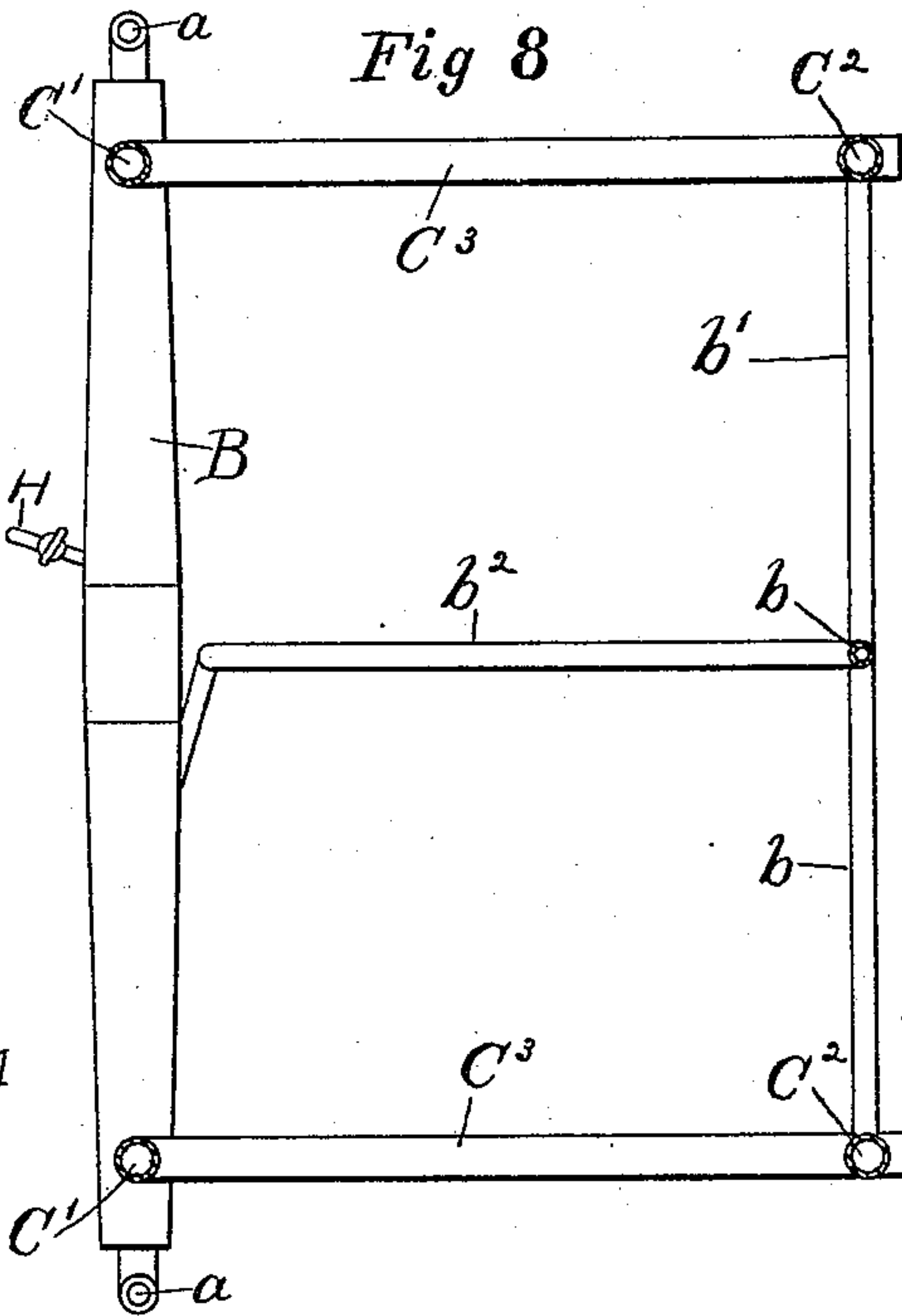


Fig 8

Witnesses
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UNITED STATES PATENT OFFICE.

FRANK SAUMENIG, OF SPRINGFIELD, OHIO.

THERMOSTAT FOR INCUBATORS.

SPECIFICATION forming part of Letters Patent No. 433,910, dated August 5, 1890.

Application filed November 23, 1888. Serial No. 291,716. (No model.)

To all whom it may concern:

Be it known that I, FRANK SAUMENIG, a citizen of the United States, residing at Springfield, in the county of Clark and State

Ohio, have invented certain new and useful Improvements in Incubators, of which the following is a specification.

My invention relates to improvements in incubators; and the object of my invention is to provide an incubator in which an even temperature is maintained throughout, the construction being such that the sides and corners are heated to an even temperature with the center portion of the incubator.

A further object of my invention is to provide a sensitive and accurate temperature-regulator.

My invention consists in the various constructions and combinations hereinafter described, and pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a perspective view of a device embodying my invention. Fig. 2 is a vertical sectional elevation view of the same. Fig. 1^a is a detail. Fig. 3 is a plan view in detail of a portion of the temperature-regulating device. Fig. 4 is a detail view in perspective of the lamp-regulating device. Fig. 5 is a vertical sectional elevation view through the side circulating-tubes. Fig. 6 is a horizontal sectional view showing the arrangement of the circulating-tubes and evaporating-pans. Fig. 7 is an elevation view of the reservoir and circulating-tubes in detail. Fig. 8 is a plan view of the same with the reservoir removed. Fig. 9 is a sectional view of a portion of the boiler at the point where the lamp is attached. Fig. 10 is a longitudinal sectional elevation view of a portion of the same.

Like parts are indicated by similar letters of reference throughout the several views.

In the said drawings, A A represent the outer casing of the device, preferably supported on suitable legs *a*.

B is a boiler, to which heat is applied by a suitable lamp B', preferably supported on a bracket B², attached to the bottom of the outer casing A A. The lamp B' is provided

with a chimney B³, which projects upwardly into a chamber B⁵ in the boiler B. Extending each way from the chamber B⁵ and passing longitudinally through the boiler B are smoke-flues *a'*, which pass through the ends of the boiler B and project upwardly, as shown in Figs. 1 and 2.

Located within the casing A A, near the top thereof, is a reservoir C, the outer perimeter of which is slightly smaller than the inside of the casing A A. The reservoir C is connected directly to the boiler B at the front corners of the casing by the circulating-tubes C' C' and at the rear corners by tubes C² C², which connect with longitudinal tubes C³, extending across the incubator at the sides and bottom and join the front tubes C'. (See Fig. 5.) Near the center of the rear portion of the casing A A is a small vertical tube *b*, connected at the top with the reservoir C and near the bottom of the casing by the branch tubes *b'* *b'* to the vertical tubes C², and by a forwardly-extending tube *b*², which extends forwardly along the bottom of the casing A A, to the boiler B, the tube *b*² being dropped down, as shown in Figs. 5 and 7, so as to enter the boiler B at the bottom thereof. The reservoir C is filled through an opening *b*³, provided with a suitable screw-top or other fastening, thus filling the circulating-tubes and the boiler.

Extending transversely across the casing A A and just below the reservoir C is a shelf D, on which is located the temperature-regulator. This consists, preferably, of two bars *c'* and *c'*, of hard rubber, supported on suitable knife-edged bearings *c*² on the shelf D, the bar *c* being connected at one end to the shelf D and at the other to a pivoted cross-lever *c*³, the other bar *c'* being connected to the cross-lever *c*³ at one end and at the other to a rod *c*⁵, which projects through the casing A A, and is provided with an adjusting-nut *c*⁷, adapted to bear against the bifurcated end of an L-shaped pivoted lever *d*.

The lever *d* is provided with suitable trunnions *d'*, preferably provided with knife-edges, resting on bearings *d*² on casing A A. The lever *d* is connected at the outer end by a suit-

able connecting-rod d^3 to a balance-arm d^5 , resting on a knife-edged bearing d^7 on top of the casing A A, and provided at its outer end with a weight d'' .

5 Extending downwardly from the outer end of the lever d is a connection e , which leads to a pivoted lever e' , provided at the outer end with the weight e^2 and connected at the inner end by a suitable connection e^3 to the regulat-
10 ing device on the lamp B'.

The lamp-regulating device which I preferably use consists of an outer sliding tube or shield f , adapted to slide over the wick-tube f' and be raised and lowered thereon by a
15 crank-shaft f^2 , so as to decrease the amount of flame in a well-known manner, (see Fig. 4,) this particular construction forming no part of my present invention.

The egg-trays E E' are supported on suitable ways g between the lower circulating-
20 tubes C^3 and b^2 and slightly above the same. Immediately below the egg-trays E E' are evaporating-pans F, provided with compartments h' h^2 of different sizes adapted to con-
25 tain water for evaporation to secure the proper moisture in the atmosphere necessary to the successful incubation. At the ends of the evaporating-pans F are small cold-air ducts
30 i , which pass through the bottom of the casing A A and furnish fresh air to the inside of said casing.

Near the middle of the top of the casing A A is an outlet-opening G, which passes through the reservoir C into the space above the egg-
35 trays E E', and is provided with a suitable damper j to regulate the escaping moisture, and thus regulate the humidity of the atmosphere within the incubator.

The operation of the device thus described
40 is as follows: The reservoir, boiler, and circulating-tubes being filled, as above described, the lamp B' is lighted and turned up so as to burn as brightly as possible without smoking. The heat and products of combustion pass
45 into the chamber B⁵ and thence through the combustion-flues a' to the atmosphere at either side of the outer casing A A, imparting the heat to the water which surrounds said flues in the boiler B. As the water becomes heated
50 in the boiler, it rises through the circulating-tubes C' C' to the reservoir C, the cold water being conducted downward through the tubes b b' b^2 and enters the bottom of the boiler B. A circulation is thus obtained through the en-
55 tire system of tubes by which all the water in the reservoir and said tubes is heated to an even temperature, which temperature is imparted to the chamber within the outer casing A A. When the temperature rises to a point
60 sufficient to expand the rods c and c' , the expansion thereof is transmitted to the lever d , which, by reason of the weight e^2 , is drawn down, thus raising the pivoted lever e' , which, through the medium of the connection e^3 , op-
65 erates upon the crank-shaft f^2 and raises the shield f , thus reducing the flame of the lamp

and cutting off the heat-supply. A discharge-
pipe H, provided with a suitable stop-cock H', is provided at the bottom of the boiler, so that
70 the water in the said boiler, circulating-tubes, and reservoir may be drawn off, as desired, and be replaced by fresh as it becomes nec-
essary.

By the above construction I am enabled to regulate the temperature to a uniform de-
75 gree, all parts of the incubator being heated alike. The circulating-pipes passing down at the corners and along the sides at the bot-
tom of the incubating-chamber, the cold cor-
80 ners and sides are obviated, the sides, if any-
thing, being slightly warmer than the center.

By use of the pivoted expanding rods c and c' , I get double the amount of expansion than when a single rod is used, and by use of
85 the levers, connections, and weight, as de-
scribed, a perfect regulating device is secured of the most delicate and sensitive nature. By having the balance-lever d^5 attached to the
outer end of the operating-lever d at one side
90 and the weighted lever e connected thereto
at the other side the weight of the said oper-
ating-lever is counterbalanced and all lost
motion is obviated in the regulating mech-
anism, so that the slightest movement of the
95 expansion bars is transmitted directly to the
lamp-regulator. The nut c^7 permits the de-
vice to be adjusted to secure a greater or less
degree of heat.

By use of the combustion-flues and the
lamp, as described, in connection with the
100 boiler, all products of combustion are carried
away from the incubating-chamber and dis-
charged into the outer atmosphere.

By use of the moisture-pans having the
compartments therein, as described, and the
105 escape-flue G the moisture may be regulated
to secure the conditions necessary to the suc-
cessful incubation.

Having thus described my invention, I
claim—
110

1. The combination, with an expansion rod, of an L-shaped pivoted operating-lever, a bal-
ance-lever connected thereto at one side and
a regulating-lever at the other side, and a
weight adapted to operate said regulating-
115 lever upon the downward movement of the
said operating-lever, and a variable connec-
tion between said expansion rod and operat-
ing-lever, substantially as specified.

2. The combination, with an expansion rod, 120
of an L-shaped operating-lever provided with
laterally-projecting trunnions on which it is
adapted to operate, a regulating-lever con-
nected to said operating-lever, a weight to op-
erate said regulating-lever, and a counter- 125
balance connected to said operating-lever on
the opposite side from said regulating-lever,
substantially as specified.

3. The combination, with an expansion de-
vice consisting of two horizontal hard-rubber 130
bars supported on knife-edged bearings and
connected, as described, of an L-shaped op-

erating-lever having the knife-edged bearings, a regulating-lever connected to said operating-lever, a weight to operate said regulating-lever, a counter-balance connected to
5 said operating-lever on the opposite side from said regulating-lever, and a variable connection between said expansion device and operating-lever, substantially as specified.

In testimony whereof I have hereunto set my hand this 15th day of November, A. D. 1888.

FRANK SAUMENIG.

Witnesses:

PAUL A. STALEY,
CHASE STEWART.