

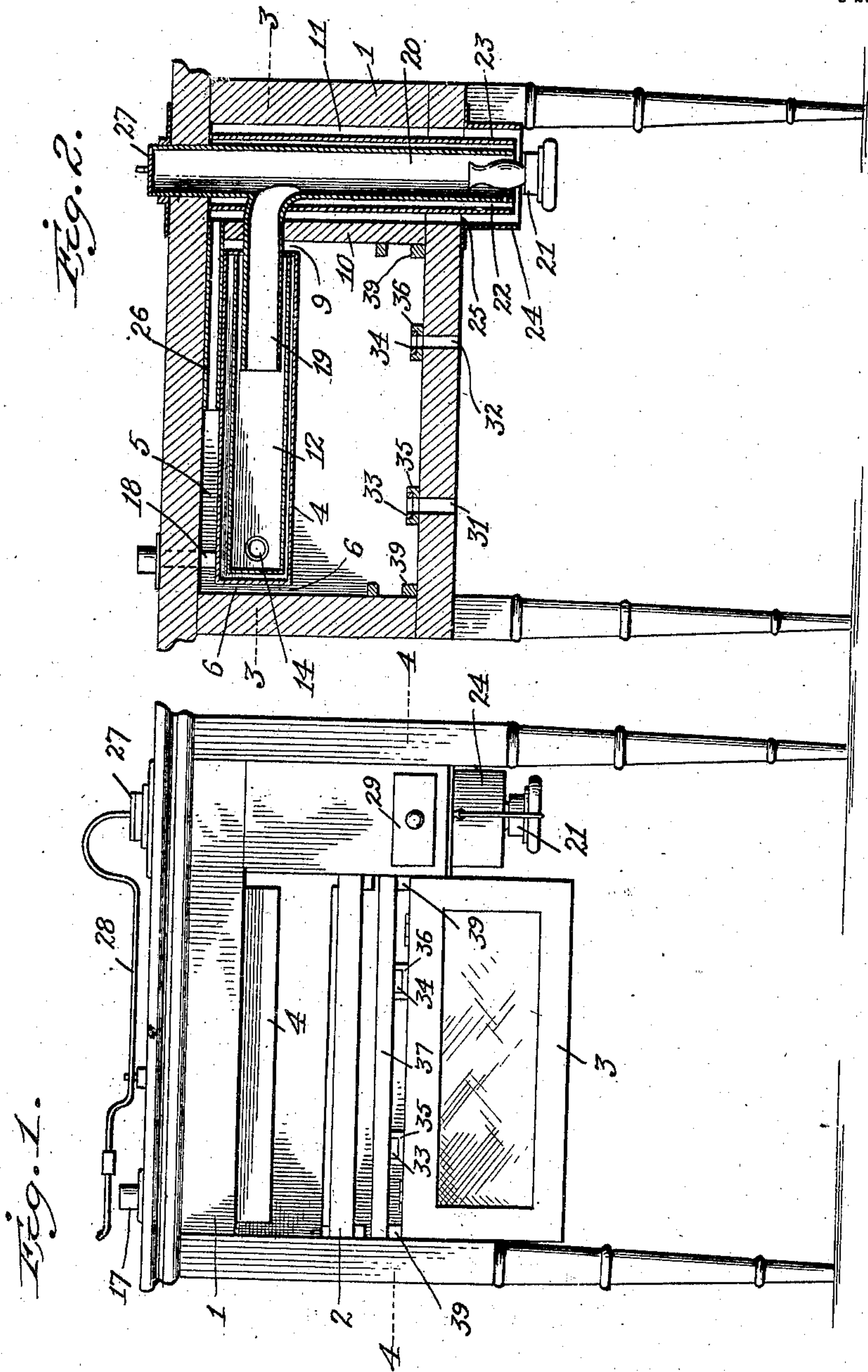
No. 850,523.

PATENTED APR. 16, 1907.

J. L. COUSINS.
INCUBATOR.

APPLICATION FILED NOV. 1, 1906.

3 SHEETS—SHEET 1.



Witnesses

Edmund L. Jewell

H. E. Montague

Inventor

Jason L. Cousins

By

John H. Valt

his Attorney

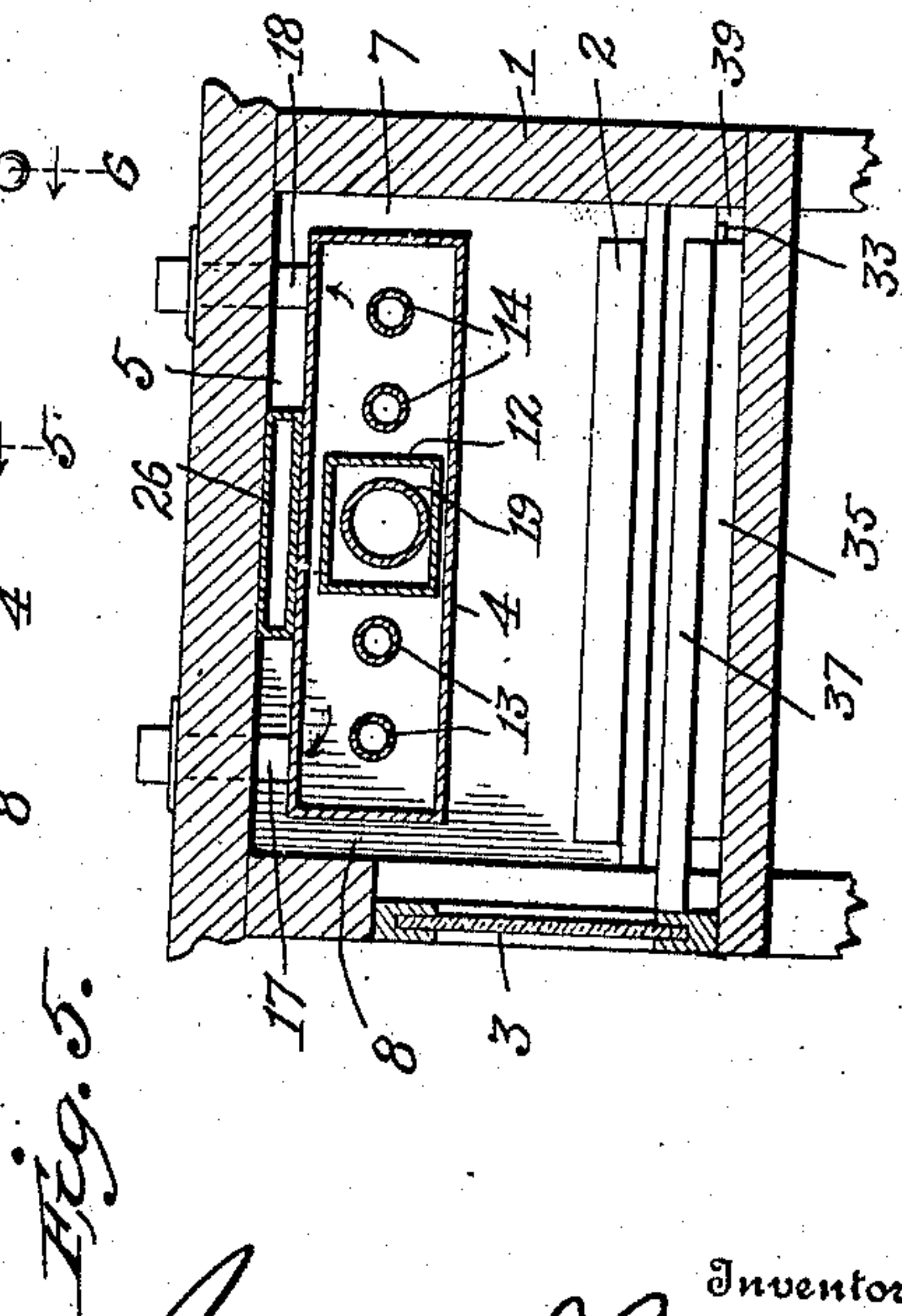
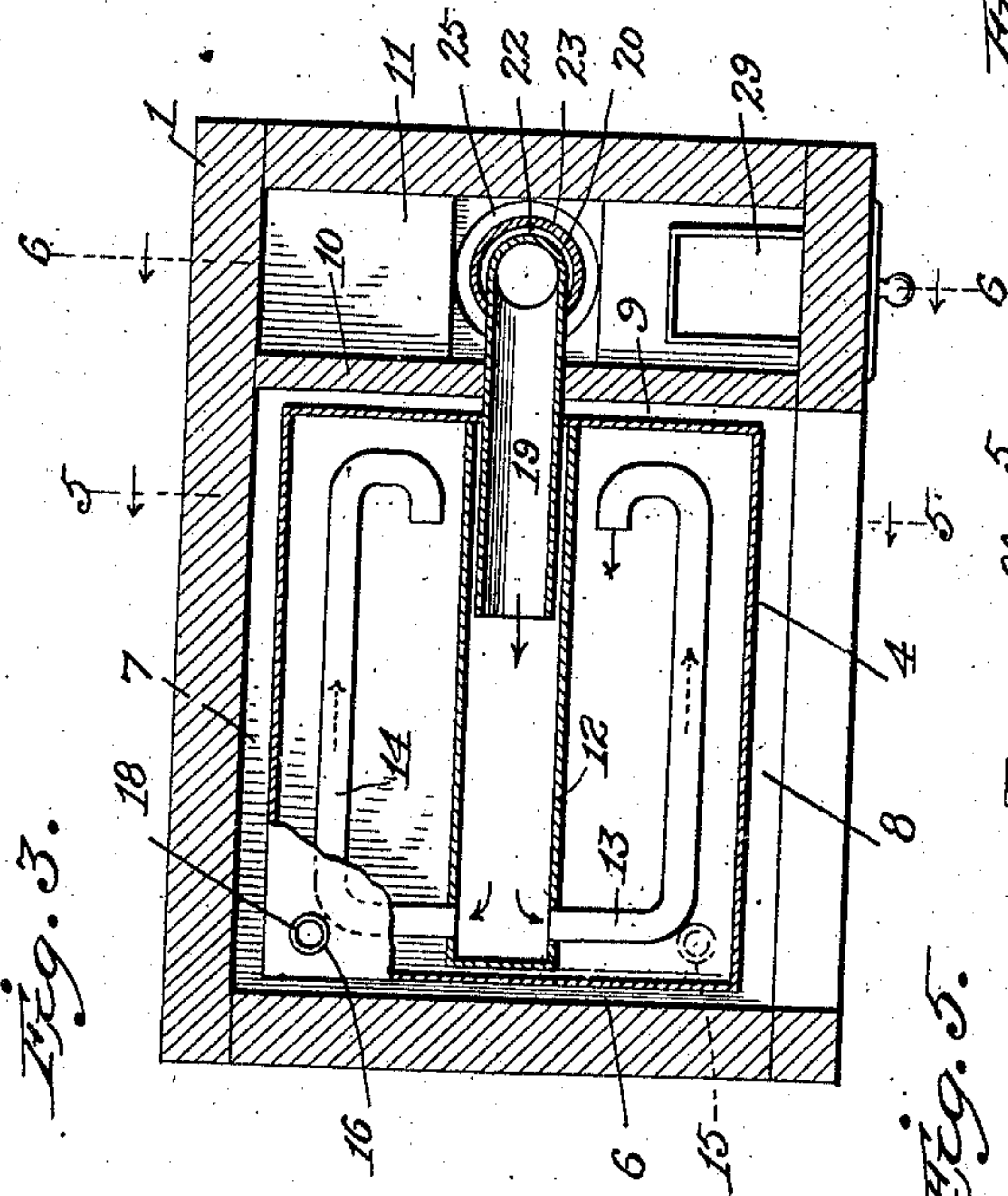
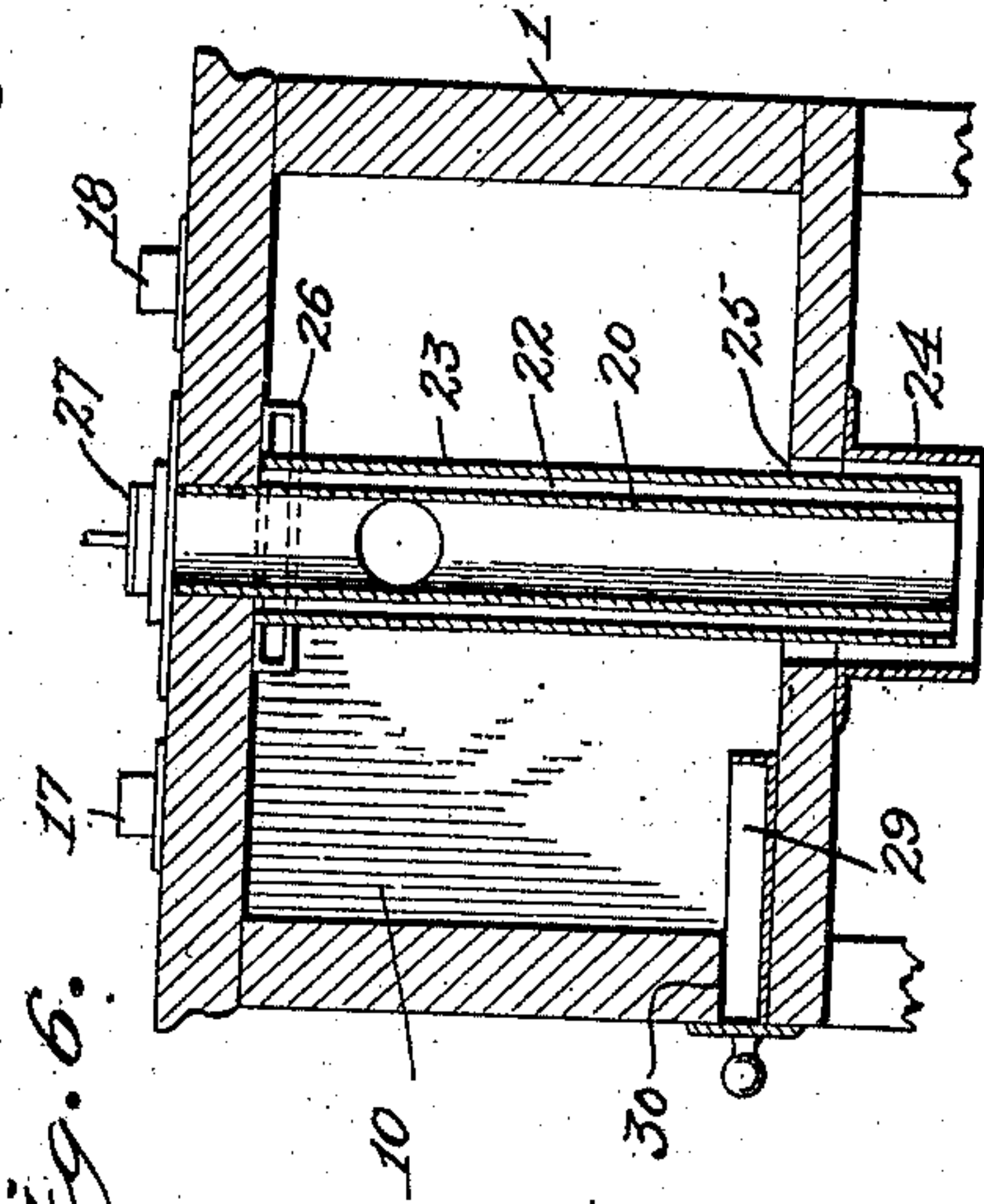
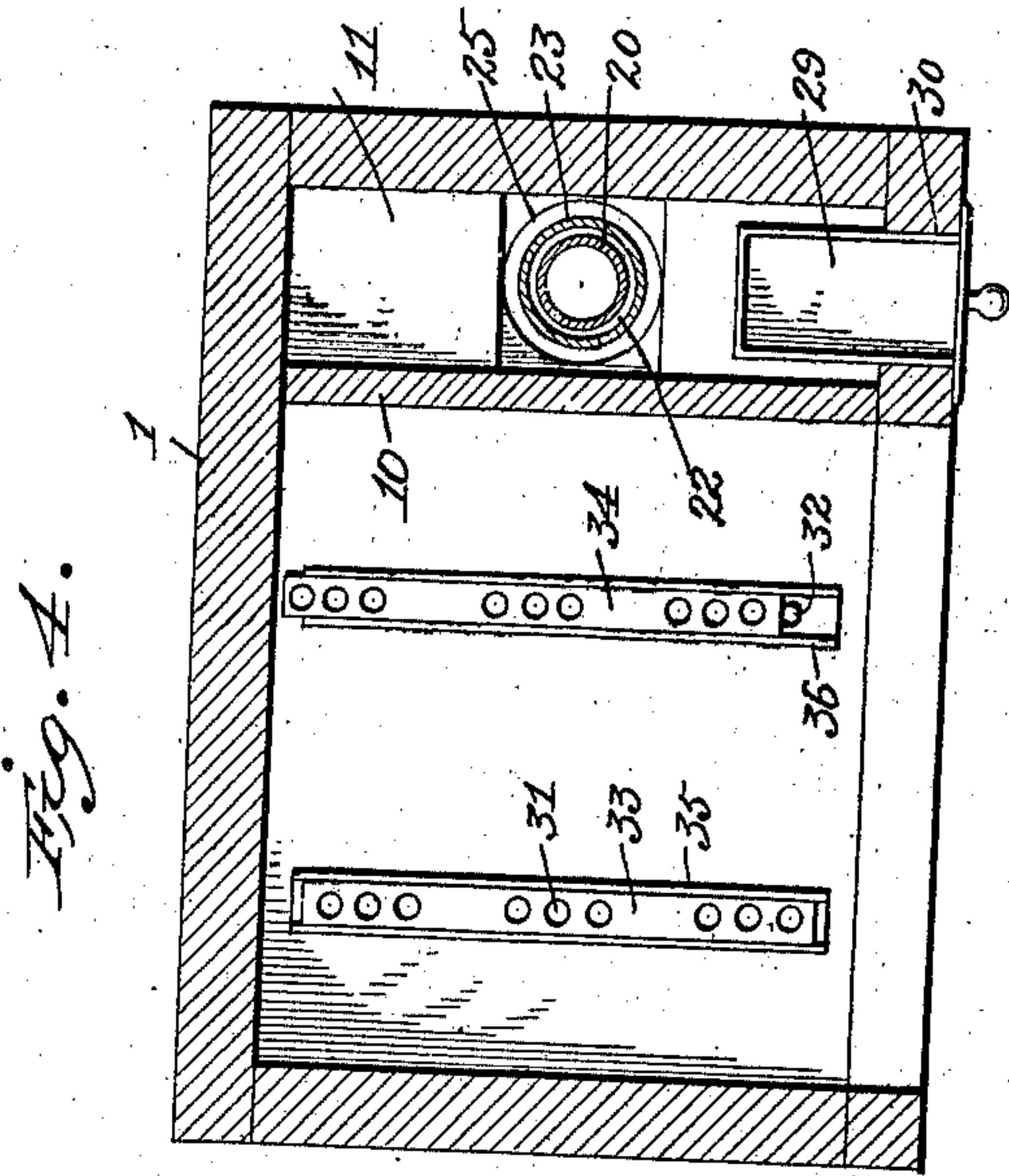
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3 SHEETS—SHEET 2.



Witnesses
Edwin L. Jewell
H. E. Montague

By

Inventor
Jason L. Cousins
John H. Nash
his Attorney

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3 SHEETS—SHEET 3.

Fig. 8.

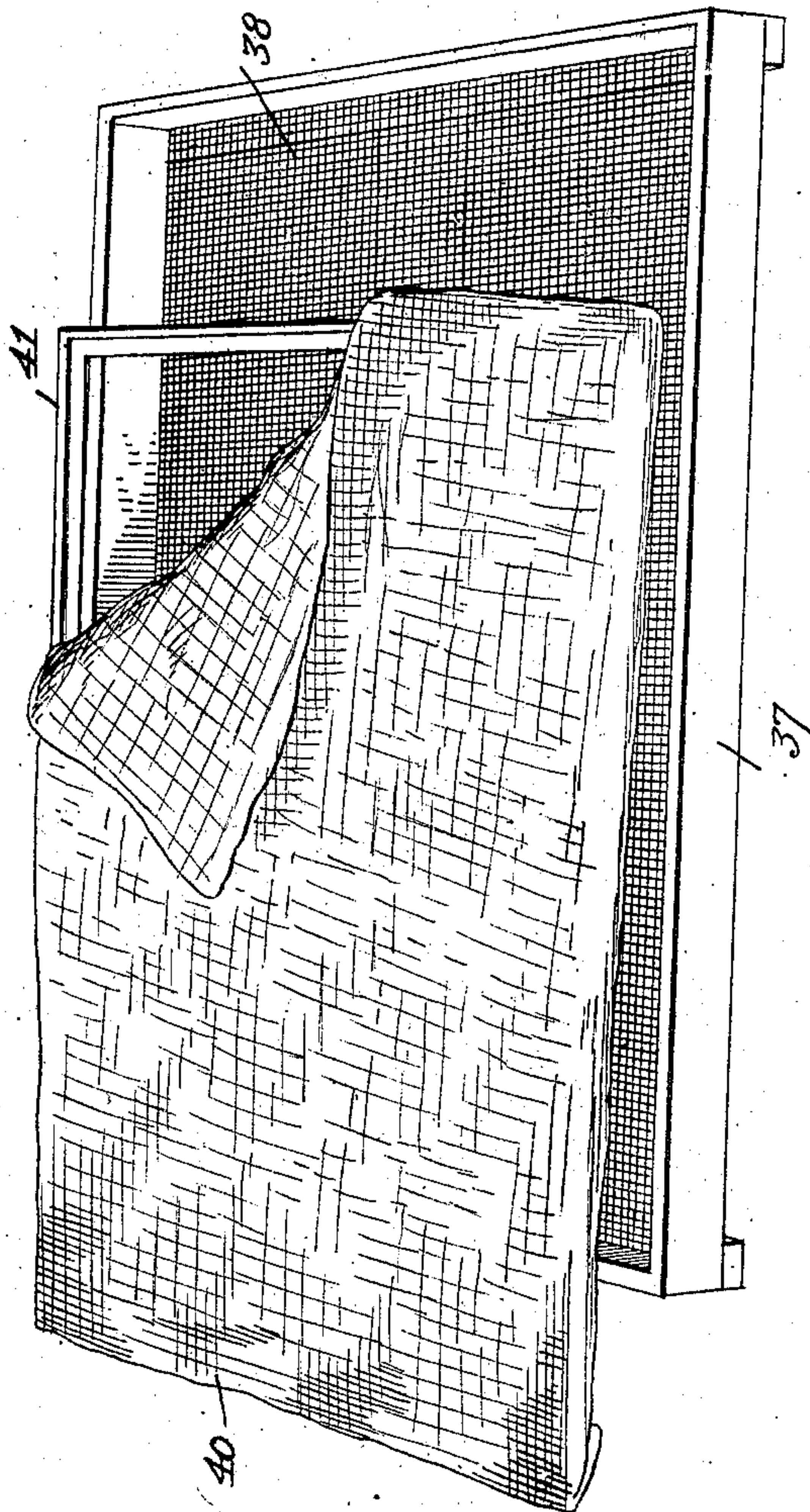
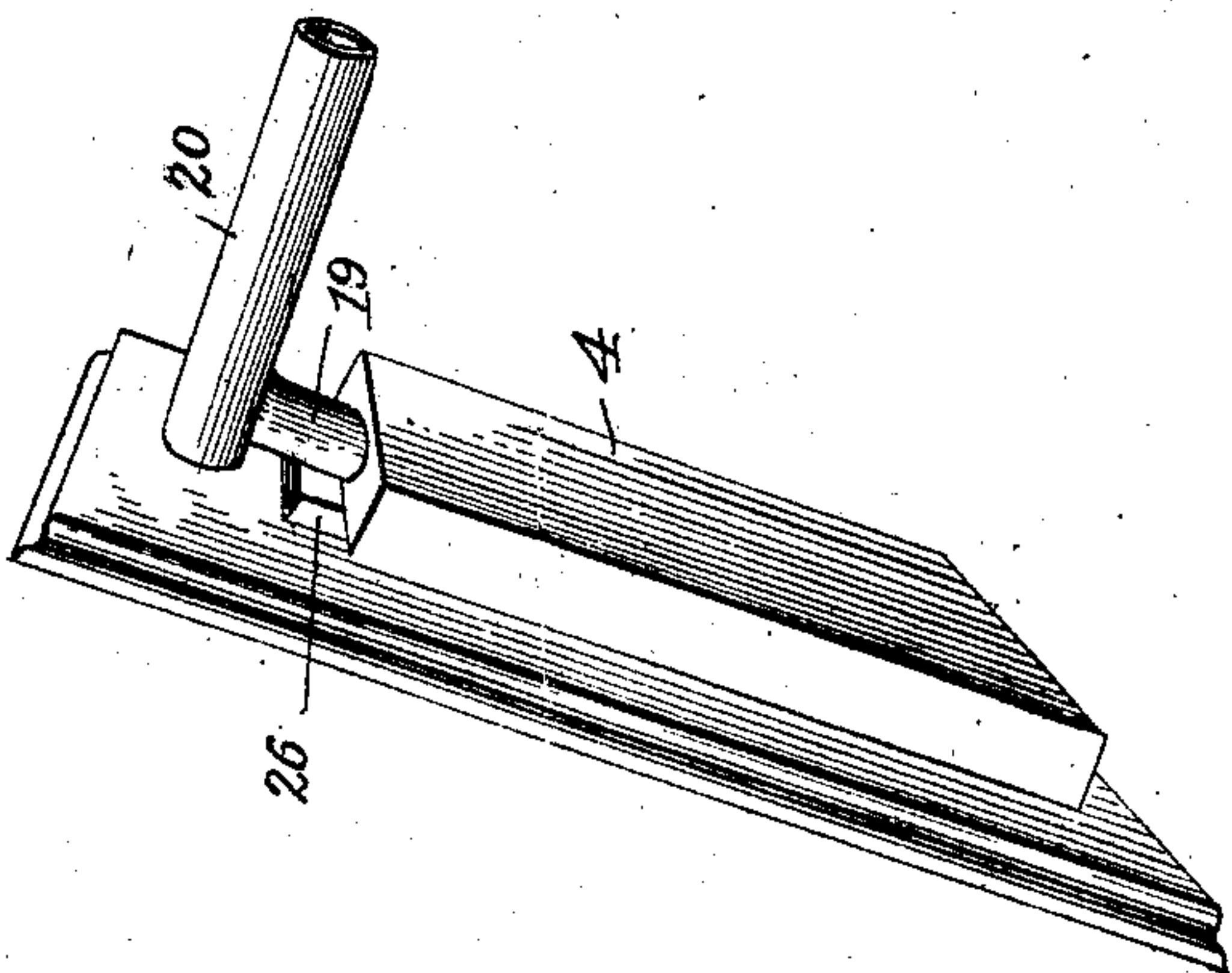


Fig. 7.



Witnesses

Edwin L. Jewell
H. E. Montague

By

Inventor

Jason L. Cousins
John H. Kalk
his Attorney

UNITED STATES PATENT OFFICE.

JASON L. COUSINS, OF WARREN, PENNSYLVANIA, ASSIGNOR TO COUSINS INCUBATOR COMPANY, OF WARREN, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

INCUBATOR.

No. 850,523.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed November 1, 1906. Serial No. 341,589.

To all whom it may concern:

Be it known that I, JASON L. COUSINS, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented certain new and useful Improvements in Incubators, of which the following is a specification.

The objects of this invention are to maintain an even temperature throughout the egg-chamber, to better diffuse and circulate fresh air among the eggs, to effect better ventilation of the egg-chamber, to provide improved means for the application of moisture to the eggs, and to improve the efficiency and construction of incubators generally.

A form of my said invention is illustrated in the accompanying drawings, wherein—

Figure 1 represents the incubator in front elevation with the front glass door open; Fig. 2, a central vertical longitudinal sectional view of said incubator with the egg-tray and nursery-tray removed; Fig. 3, a horizontal sectional view of the same, taken along the line 3 3, Fig. 2, with egg and nursery trays removed; Fig. 4, a similar view taken along the line 4 4, Fig. 1; Fig. 5, a vertical cross-section taken along the line 5 5, Fig. 3, showing the egg and nursery trays in elevation; Fig. 6, a vertical cross-section taken along the line 6 6, Fig. 3; Fig. 7, a perspective view of the incubator-top with radiator attached, and Fig. 8 a perspective view of the nursery-tray.

Referring to the accompanying drawings, 1 represents the incubator-casing, the walls of which may be of any suitable construction, and 2 the egg-tray, which may also be of any desired construction. The front of the incubator is closed by means of a hinged glass door 3, which may be of the usual construction.

Located within the incubator-casing a suitable distance above the egg-tray is the heat-radiator, which in this case consists, among other parts, of a preferably flat metallic air-tank 4, suspended from the top of the incubator-casing, so as to leave an air-space 5 of about an inch in depth between the incubator-casing and the top of the radiator. The radiator may be supported from the incubator-casing, as shown, by means of the hot-air outlets 17 and 18, hot-air pipe 19, and the lamp-tube 20, all hereinafter more fully re-

ferred to, the said outlets and lamp-tube being attached to said casing. The wall 10 may afford additional support by engaging the lower side of pipe 19. The air-tank 4 is made of such a size and so located relative to the inner walls of the incubator-casing as to leave suitable air-spaces 6, 7, and 8 (see Fig. 3) between the sides of the radiator and the inner walls of the incubator-casing, and also a space 9 between one end of the radiator and a partition-wall 10, which, with the incubator-casing, forms a ventilation and moisture chamber 11, hereinafter more fully described.

Inclosed within the tank 4 and extending approximately the whole length thereof is a tube 12. Communicating with the interior of this tube and extending from two sides thereof, near one end, are two pipes 13 and 14, which extend alongside of the tube 12 to a point near the other end of the tank, where they bend and open in the direction toward that end of the tank where they are connected to the tube 12.

Located in the top of the tank 4, near one end thereof, are two openings 15 and 16, which register with outlet-tubes 17 and 18, respectively, which pass through the top casing of the incubator to the outside air.

Extending through one end of the tank 4 into the tube 12 and passing to a point about midway of the length of said tube is a pipe 19, which is attached to and opens into the main lamp-tube 20, which latter extends vertically through the center of the chamber 11, upward through the top casing of the incubator, and downward through the bottom casing thereof to a suitable point. This tube 20 is located above and receives the heat and products of combustion of a lamp 21 or other suitable source of heat. Surrounding the lamp-tube 20 and extending the length thereof, with an air-space 22 between the two, is a jacket 23, which greatly reduces the danger from fire, due to heat from the tube 20. The jacket 23 is in turn inclosed at its end which extends below the bottom of the incubator by an annular jacket 24, which registers with an opening 25 in the bottom of the chamber 11 and which jacket 24 forms a duct for conveying fresh air into the chamber 11.

Opening through the partition 10 into the

upper portion of the chamber 11 and extending over the top of the tank 4 to a point about midway of the length thereof is a duct 26, consisting, preferably, of a flattened metal tube, the office of which is to convey fresh air from the chamber 11 to the space between the incubator-casing and the top of the radiator-tank.

Over the upper end of the lamp-tube 20 is adapted to fit a cap 27, attached to a suitable lever 28, which operates said cap to open and close the upper end of said lamp-tube in the usual manner, the lever 28 being operated by any desired form of thermostat.

A small moisture-pan 29 passes through an opening 30 in the front of the machine into the chamber 11.

Passing through the bottom of the incubator-casing are a series of ventilating-openings 31 and 32, which are controlled by slide-valves 33 and 34, respectively, the said valves being mounted to slide in guideways 35 and 36, respectively, located on the bottom of the machine.

In the bottom of the egg-chamber, directly beneath the egg-tray, may be located a nursery-tray comprising a rectangular frame 37, having a wire-net bottom 38 and slidable on ways 39. Over the top of the wire-net bottom of this tray is placed a covering of burlap or other suitable porous soft material 40, which may be stretched over a frame 41. (See Fig. 8.)

The heated air from the lamp 21 passes up tube 20 and thence through tube 19 into tube 12, from which latter it passes into pipes 13 and 14, being discharged therefrom into the tank 4. The heated air then circulates in said tank and passes out through outlets 17 and 18. The fresh air passes in at the lower end of the air-space between jackets 23 and 24, thence into the fresh-air chamber 11, where it becomes more or less heated, and therefore rises to the top of said chamber and, if desired, absorbing the moisture from the receptacle 29. From the upper portion of chamber 11 fresh air passes through duct 26 over the top of tank 4 to a point near or at the center of the top of said tank, where the said air is discharged. Mingling with the heated air the fresh air passes down all sides of the egg-chamber, thus effecting an even distribution, and mingles with the eggs and the burlap in the nursery-tray, through which latter the said air passes to the bottom of the machine and out through the ventilators 31 and 32, controlled by the sliding valves 33 and 34. By means of these slide-valves the ventilation of the egg-chamber may be very accurately regulated. The heat in the lamp-tube 20 is regulated in the usual manner by the cap 27, operated by suitable thermostat mechanism. By suspending the radiator-tank, as described, out of engagement with the inner walls of the in-

cubator-casing I secure not only a greater increased heating-surface, but an extremely even distribution of the heat.

As the chicks are hatched they are attracted by the light entering the egg-chamber through the glass door and naturally go forward toward said light. In doing this they fall over the front edge of the egg-tray to the nursery-tray below, dropping on the burlap, where they may remain until taken out. In this way the hatched chicks remove themselves from the egg-tray about as fast as they are hatched, and thus prevent the entirely helpless chicks which have just been hatched from being trampled upon by the older ones. By having the burlap removable from the nursery-tray fresh pieces of burlap may be supplied with the least possible trouble.

While I have herein shown a specific embodiment of my invention, it will be understood that various modifications may be made therein without departing from the spirit of the invention, and I do not, therefore, wish to be understood as limiting myself to such specific construction.

Having thus described my invention, what I claim is—

1. An incubator, comprising a main casing in which there is formed an egg-chamber, and a combined fresh-air and moisture containing chamber walled off from the egg-chamber; a heat-radiator located in the upper portion of the egg-chamber and separated by an air-space over its top and at its sides from the inner walls of the said casing; a heat-pipe extending upward through said fresh-air chamber into said radiator, and a tube leading from the upper portion of said fresh-air and moisture containing chamber and opening for the delivery of air from said chamber at a point over the top of said radiator between the same and the top wall of said casing.

2. An incubator, comprising a main casing in which there is formed an egg-chamber, and a combined fresh-air and moisture containing chamber walled off from the egg-chamber; a heat-radiator located in the upper portion of the egg-chamber and separated by an air-space over its top and at its sides from the inner walls of the said casing; a heat-pipe extending upward through said fresh-air chamber into said radiator, a tube leading from the upper portion of said fresh-air and moisture containing chamber and opening for the delivery of air from said chamber at a point over the top of said radiator between the same and the top wall of said casing, and a moisture-receptacle slidable into said fresh-air and moisture chamber from the outside.

3. An incubator, comprising a main casing in which there is formed an egg-chamber, and a combined fresh-air and moisture con-

5 containing chamber walled off from said egg-chamber; a heat-radiator located in the upper portion of the egg-chamber and comprising a hot-air tank separated by an air-space
 10 over its top and around its sides from the inner walls of said casing; a heat-pipe extending upward through said fresh-air chamber into said tank, and a tube passing from said fresh-air and moisture containing chamber
 15 over the top of said radiator between the same and the top wall of said casing to a point substantially at the center of the radiator-top where the said tube discharges air from said chamber.

15 4. An incubator, comprising a main casing in which there is formed an egg-chamber, and a combined fresh-air and moisture containing chamber walled off from said egg-chamber; a heat-radiator comprising an air-
 20 tank and radiator-pipes inclosed in and discharging into said tank, said tank located in the upper portion of the egg-chamber and separated by an air-space over its top and around its sides from the inner walls of
 25 said casing; a heat-pipe extending upward through said fresh-air and moisture containing chamber and connected to the radiator-pipe in said tank; a tube passing from said fresh-air and moisture containing chamber
 30 to a point over the top of said radiator-tank between the same and the top wall of said casing, and adapted to discharge air from said chamber at said point, and air-outlets leading from said air-tank through the top of
 35 said main casing.

40 5. An incubator, comprising a main casing in which there is formed an egg-chamber having ventilating-openings through its bottom, and a combined fresh-air and moisture containing chamber walled off from the egg-chamber; a heat-radiator located in the up-

per portion of the egg-chamber and separated by an air-space over its top and at its sides from the inner walls of the said casing; air-outlets from said radiator through the
 45 top of the incubator, a heat-pipe extending upward through said fresh-air and moisture containing chamber into said radiator; a tube passing from said fresh-air and moisture containing chamber to a point substantially
 50 over the center of the top of said radiator between the same and the top wall of said casing where said tube discharges air from said chamber, and slide-valves to control said ventilating-openings in the bottom
 55 of the egg-chamber.

6. An incubator, comprising a main casing in which there is formed an egg-chamber and a combined fresh-air and moisture containing chamber walled off from said egg-cham-
 60 ber at one end of said casing, said air and moisture containing chamber having an opening through its bottom connecting said chamber with the outside air; a tubular jacket extending from said opening below the
 65 bottom of said casing; a heat-radiator in the upper portion of said egg-chamber; a lamp-tube extending through said jacket with an air-space between the two for fresh air to pass through into said fresh-air and
 70 moisture containing chamber, said lamp-tube passing to the upper portion of said fresh-air and moisture containing chamber and thence to said radiator, and a jacket surrounding said lamp-tube and separated
 75 therefrom by air-space.

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

JASON L. COUSINS.

Witnesses:

WILLIAM SCHNUR,

WILLIAM W. WILBUR.