

No. 813,115.

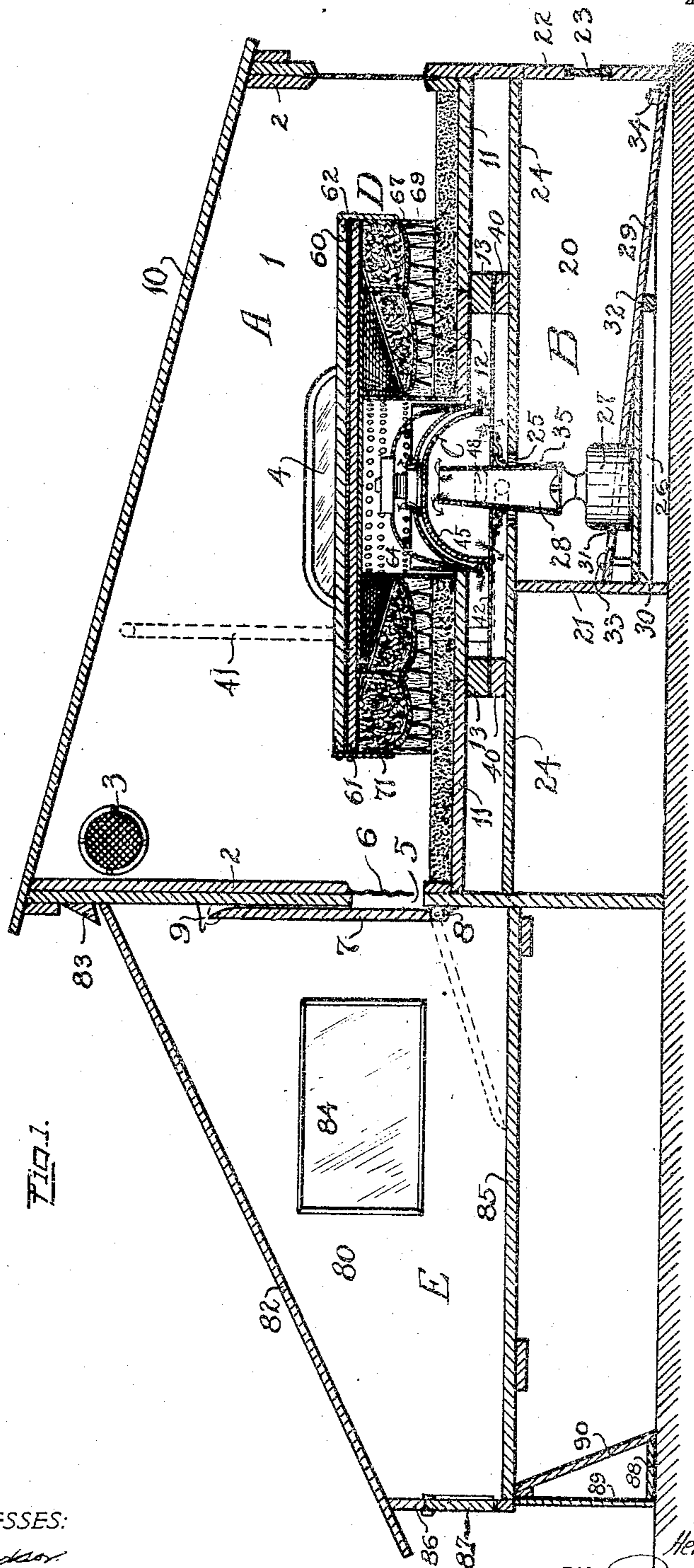
PATENTED FEB. 20, 1906.

H. F. RAU.

BROODER.

APPLICATION FILED APR. 7, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

W. E. Windsor
James M. Palmer

INVENTOR.

Henry F. Rau.

BY

R. J. Elliott
ATTORNEY.

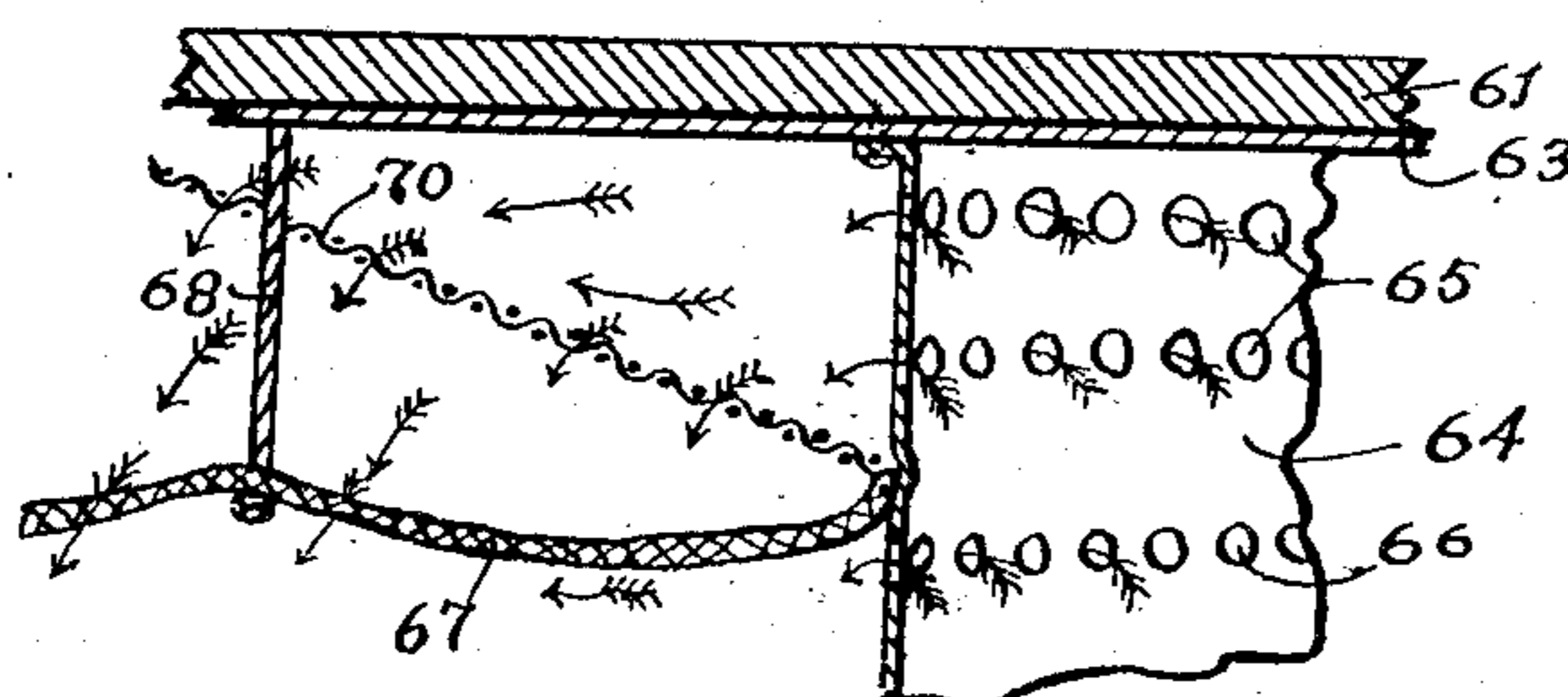
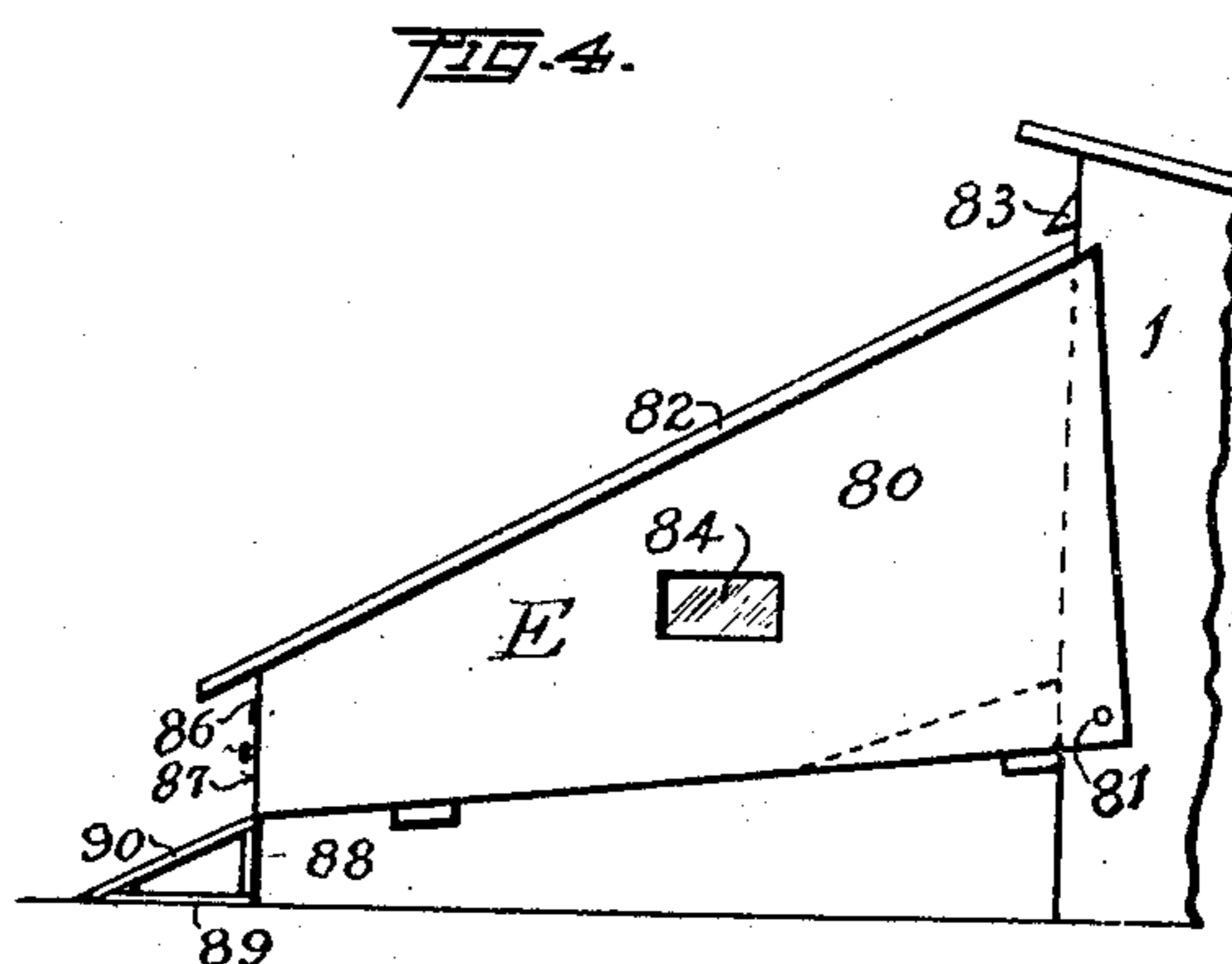
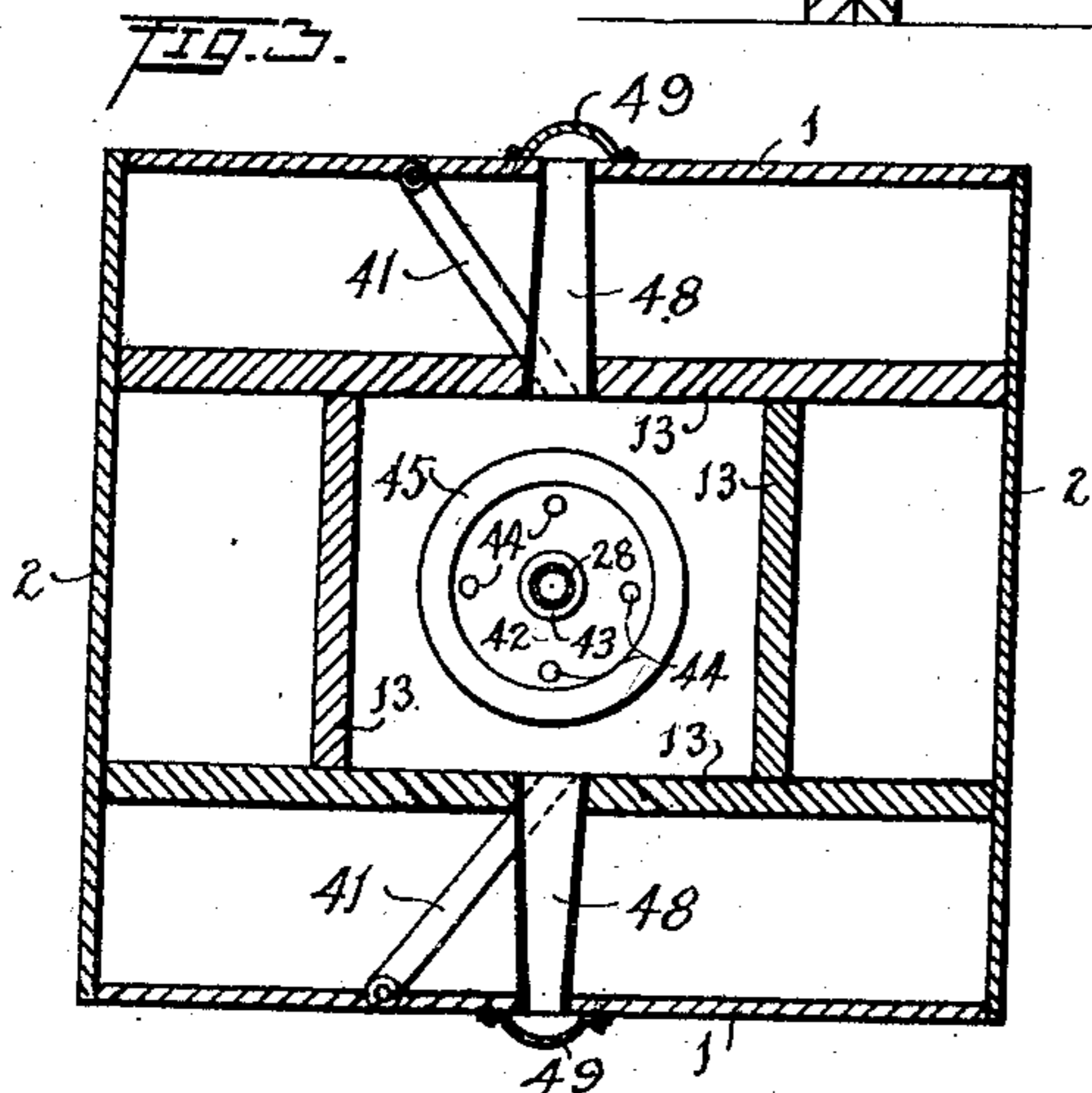
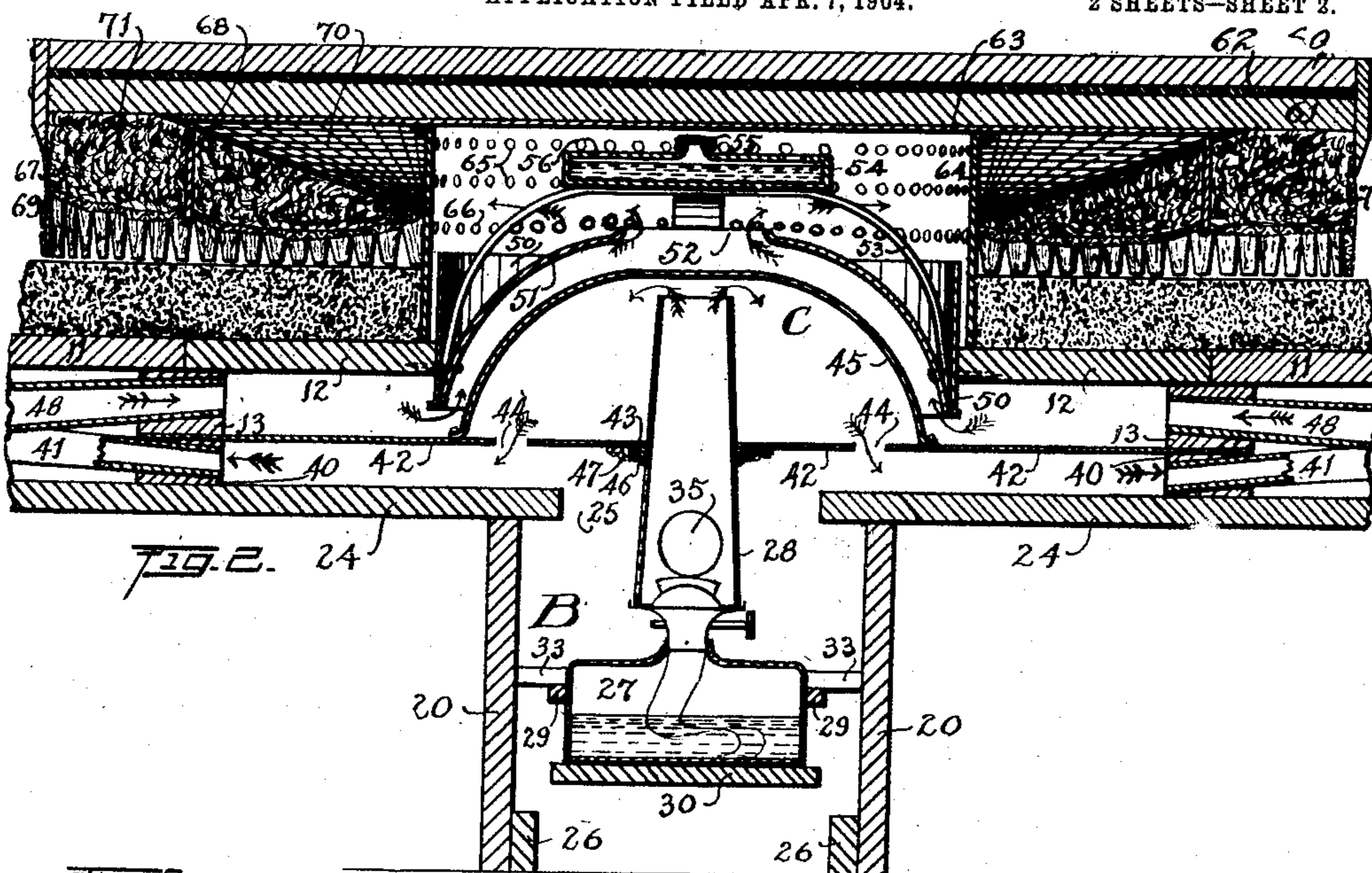
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UNITED STATES PATENT OFFICE.

HENRY F. RAU, OF TACOMA, WASHINGTON.

BROODER.

No. 813,115.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed April 7, 1904. Serial No. 201,956.

To all whom it may concern:

Be it known that I, HENRY F. RAU, a citizen of the United States of America, and a resident of Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Brooders, of which the following is a specification.

My invention relates to chicken-brooders having a brooding-chamber and a feeding and exercising room, and has for its objects, first, the protecting of the chickens from the weather and from the ravages of rats and other animals; second, to provide a hover which will effectually imitate in its action on the chickens the effects of a hen in warmth and softness of pressure on the chickens' backs; third, which will enable the chickens while under the hover to breathe the cooler pure air outside of the hover; fourth, which will keep the sand on the bottom of the brooder in a comparatively cool state, and, fifth, which will so utilize the heat from the burner that the greatest economy of fuel is attained. I attain these objects by the devices and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section through my brooder. Fig. 2 is an enlarged section through the hover and the heating arrangements on a line at right angles to the section shown in Fig. 1. Fig. 3 is a reduced horizontal section of the main brooder, taken on a line just above the diaphragm. Fig. 4 is a reduced side view of the exercising-room when in its lowest position to provide a runway for the chickens from the open ground to the main brooder; and Fig. 5 is an enlarged vertical section of the upper part of the hover, the feathers being removed from their place in order to clearly show the direction of the air-currents.

Similar letters and numerals of reference refer to similar parts throughout the several views.

In this invention I have endeavored to reproduce as closely as possible the conditions produced by a hen in caring for her young. These may be briefly summed up as follows: fresh cool air to breathe, warm air under the hover containing a normal amount of moisture, light soft weight on the backs of the chickens, thereby producing an effect similar to the contact with the hen's body, thus preventing the crowding of chickens in the corners of the brooding-chamber, and cool ground on which they stand, keeping their feet from

unnatural conditions. I have further effected a novel and effectual construction and arrangement of the heating device whereby an unusual amount of heat is utilized for a given consumption of oil, and I am thereby able to reduce to a minimum the amount of oil consumed to heat the hover to the desired temperature.

In the drawings, A represents the main brooding-chamber; B, the compartment containing the lamp; C, the devices arranged for conducting and utilizing the heat and the heated air; D, the hover; E, the exercising and feeding room.

The main brooding-chamber A consists of a box having two side walls 1 with inclined upper edges and two end walls 2. The walls 1 and 2 are double from the floor of the brooding-chamber to the roof. The walls 1 are each pierced near their highest corners by the ventilators 3, preferably covered with suitable screens to prevent the entrance into the chamber of too great a draft and also of any marauding animals or of any undesirable objects. The walls 1 are also pierced by the glazed windows 4, as is also the shorter end wall 2, to admit light into the chamber A. The other end wall 2 is provided with an opening 5 on a level with the main floor, inside of which hangs the loose cloth or curtain 6. This opening is closed by the board or platform 7, hinged at its lower edge at 8 and latched at its upper edge by the ordinary spring-latch (represented at 9) and when lowered adapted to operate as an inclined passage leading from the chamber A to the exercising and feeding room E. When the board or platform 7 is lowered, the curtain 6 prevents the entrance of too great a draft through the opening 5. The roof 10 closes the top of the brooding-chamber A, resting on the tops of the walls 1 and 2. The roof is not attached to the walls and is readily removed therefrom.

The floor of the brooding-chamber A consists of two parts—the part 11, extending from the walls 1 and 2 to about half-way toward the center of the chamber A, and the part 12, occupying the central hole left in the part 11. The part 12 itself has a circular hole in its center, as will more particularly be mentioned in the description of the parts C, mentioned above. The floor parts 11 and 12 join and are supported by means of the bars 13, resting on the similar bars 40, as herein-after described and as shown in Figs. 1, 2,

and 3. The floor parts 11 and 12 are covered with sand to a depth of about one and one-half inches. A convenient way of keeping the surface sand clean is to lay a sheet of paper below the surface of the sand, and then when it is desired to clean the brooder this paper is removed, carrying with it the surface sand, which may then be replaced by another paper and more clean sand.

Referring to Figs. 1 and 2, the lamp-compartment E is located at the bottom of the brooder-box, below the main floor thereof, and is a long narrow compartment extending from the shorter end wall 2 to a point beyond the center of the box. It is open at the bottom to allow the cool air to circulate about the lamp and burner, so as to keep the lamp cool and to supply cool air to the burner, but is closed on its two sides by the walls 20 and at its end by the wall 21. The outer wall or door 22 is removable, so as to allow the lamp and lamp-tray to be readily removed from the compartment B. The wall or door 22 has a small glazed hole 23 therein, adapted to allow the flame of the lamp to be inspected. The top of the compartment B is closed by the horizontal ceiling 24; extending across the brooder-box at a level lower than the above-described floor parts 11 and 12 and having a hole 25 at the center directly over the lamp. Each of the sides 20 of the compartment B is provided with a strip or track 26 along its lower edge. The lamp 27 is independent of the metal lamp-chimney or flue 28 and is supported on the lamp-tray, which consists of the board 29, extending the length of the compartment B, and the board 30, secured to the lower side of the board 29 and adapted to support the lamp 27, which rests thereon and extends upward through the hole 31 in the board 29. The tray has a bar 32 near its center adapted to ride on the above-mentioned strips 26. The lamp end of the tray is also provided with a pair of guide-pieces 33, extending sidewise and engaging the walls 20 to guide the lamp 27, so that it will be placed directly under the chimney 28. The other end of the tray is engaged by the cleats 34, which are pivoted to the strips 26 close to the door 22. When the tray-board 29 is pressed downward at its outer end, it will tip on the bar 32, raising the lamp 27 to the base of the chimney 28, and the cleats 34 are turned to engage the end of the board 29 to retain it in this position. The chimney 28 is provided with a small hole 35 in line with the glazed hole 23 and low enough down in the chimney so that the flame of the lamp may readily be seen through it even though the flame be turned very low, as is normally the case with my brooder.

The heater C consists of the lamp 27, the chimney 28, and the following parts, arranged and constructed substantially in the following manner: Referring to Figs. 1, 2,

and 3, attention is called to the space between the floor 11 12 and the ceiling or horizontal partition 24. This space is divided into two portions by the bars 13 and 40. The outer portion has nothing to do with the heating and is always cool. The advantage of this is that the part 11 of the main brooder-floor is kept cool, as no warmed air comes in contact with it. The bars 40, which are arranged in the same way as the bars 13, (shown in Fig. 3,) rest on the upper side of the ceiling 24. The two smoke-pipes 41 lead through the bars 40 to the outer double walls 1 and pass upward in them, being preferably conducted between the parts forming the double walls and having an outlet into the open air near the roof 10. These pipes 41 pass from the inner smoke-chamber at points near the middle of two opposite sides, as shown in Fig. 3. On top of the bars 40 is laid the iron diaphragm or plate 42, having a central hole 43, through which the chimney 28 passes, and it also has the four small holes 44. Secured to the upper side of this plate 42 is the heater-dome 45 directly over the chimney. This dome is high enough to allow a slight space between it and the top of the chimney 28 and is broad enough to join the plate 42 outside of the above-mentioned holes 44. The metal chimney 28 is provided with lugs 46, which are adapted to engage lugs 47, secured to the under side of the diaphragm 42, so that it is supported in position by the plate. The heat generated by the lamp-flame, together with the hot gases, smoke, &c., rises up the chimney 28 and fills the dome 45. As the heat is extracted from the gases, &c., they fall and pass through the small holes 44 in the plate 42 to the smoke-pipes 41, leading through the outer space between the floor part 11 and the ceiling 24, and thus up inside the walls 1 of the brooder and out into the open air. It is plain that all the hot air, &c., is concentrated under the dome and that only the part which has given up its heat escapes and make room for more heated air. In this way I am able to operate my brooder for one hundred chickens in the coldest weather with a flame turned so low that the consumption of oil is only about one pint in forty-eight hours. None of the vitiated air, gas, or smoke from the lamp can possibly gain admittance to the brooding-chamber.

The bars 13 are placed over the bars 40, (having the diaphragm or plate 42 between them,) and the parts 11 and 12 of the main floor rest directly on the bars 13. The cool outside air is admitted into the central space inclosed by the bars 13 through the two air-pipes 48. These pipes 48 lead directly from the outside of the walls 1 through the outer cool chamber between the floor 11 and the ceiling 24 and through the bars 13, entering the said central space directly over the point where the smoke-pipes 41 pass through the

bars 40, as shown in Figs. 2 and 3. The outer ends of these air-pipes 48 are protected from too strong a draft or wind by the shields 49, which are open above and below, admitting air to the pipes, but obstructing any too great rapidity of motion of the air.

The central part 12 of the main floor rests on the bars 13 and is provided with a large central hole therein of somewhat greater diameter than the dome 45. Into this hole is fitted and secured the short cylinder or pipe 50, extending upward above the floor and downward below it and around the dome, leaving, however, a space between its bottom and the top of the plate 42, through which the air to be heated may pass. To the bottom edge of this pipe 50 is secured the dome-shaped piece 51, having a central opening 52 at its top and being supported in a position rather close to but not touching the dome 45. The space thus formed is the heating-chamber, where the fresh air from the pipes 48 is heated, so as to be delivered to the hover D.

Over the central hole 52 in the outer dome 51 is supported on four legs 53 the moisture-can 54. This can is placed sufficiently close to the hole 52 that it will receive the heat therefrom and will direct it toward the sides instead of allowing it to pass straight upward. The can 54 I prefer to construct with a central inlet-top 55 and with outlet or evaporation holes 56, through which the heated water will slowly evaporate, restoring to the heated dry air the normal amount of moisture. The hover D receives the warm moist air and delivers it to the backs of the chickens which are under it and at the same time presses lightly on their backs. It consists of the following parts: The cover consists of the two boards 60 and 61, secured together with a layer of paper or of some other heat-insulating material between them, as shown at 62. To the under side of the lower board 61 is secured the metal plate 63, to which is secured the cylindrical piece 64, adapted to rest on the floor 12 and to support the hover. The length of the cylinder 64 is such that it will bring the plate 63 close to but not touching the top 55 of the water-can 54, and its diameter is greater than the diameter of the cylinder 50 above described. The cylinder 64 is provided with two rows of holes 65 near its upper end or near the plate 63 and also with a lower row of holes 66, located lower down than the hereinafter-described hover-cloth, so that the cooler part of the warm air may pass beneath the hover-cloth to keep the space where the chickens stand free from foul odors and stagnant air. To the outer rim of the hover-cover 61 is secured the hover-cloth 67, which drops therefrom to a point an inch or two above the sand of the floor. This hover-cloth is made of thin soft material and is secured to the cylinder 64 between the above-mentioned holes 65 and

66 by any suitable means and may be supported at intervals from the cover 61 by means of anchor-strings 68. The hover-curtain 69 is secured to the cover 61, extending around the hover, and is cut vertically in the usual manner to enable the chickens to enter readily under the hover and to allow them to sit with their bodies under the hover, but with their heads protruding from the curtain 69. Secured to the cylinder 64 at the same place that the hover-cloth 67 is secured is the inner part of the conical wire-netting 70, extending upward and outward from the cylinder 64 to the plate 63, to which its outer end is attached. This wire-netting extends entirely around the cylinder 64, forming a space between it and the cylinder, in which the air-currents are equalized and distributed along the surface of the netting. It also forms a space between it and the hover-cloth 67. This latter space is filled with feathers or other light, warm, and soft materials 71. The warm moist air passes through the holes 65 and into the space between the cylinder and the netting, then through the netting all over its surface, then through the feathers 71 and the hover-cloth 67 to the backs of the chickens. The cooler air passes directly through the holes 66 under the hover-cloth 67 to provide air for ventilation and for breathing for the chickens which have their heads under the hover. The feathers 71 form a reservoir of heat, preventing drafts, but allowing a constant stream of warm moist air to be evenly diffused through them to the bodies of the chickens, and at the same time allowing the chickens to press upward against them without putting much weight on their backs.

The exercising and feeding room E consists of the two sides 80, pivoted to the two sides 1 of the main brooder at 81 and shaped with an inclined upper edge on which the roof 82 rests loosely. The upper edge of the roof 82 is placed flush against the wall 2 of the brooder under the weather-strip 83, which is secured to said wall 2. The sides 80 are supplied with windows 84, which provide light to the room. The floor 85 of the exercising-room is placed at a lower level than that of the brooding-chamber, as clearly shown in Fig. 1. The outer wall 86 of the room is provided with a removable door 87. Access is had to the floor 85 from the brooding-chamber through the above-described opening 5 and down the inclined plane 7 when it is lowered. The outer end of the exercising-room is supported on the removable support, which is formed in the shape of a right-angled triangle having the two sides forming the right angle of unequal lengths, the shorter side 88 being used as a base and the longer side 89 as the support when the part E is to be used only as an exercising and feeding room and when the door 87 is in place, but

the long side 89 being used as a base and the short side 88 as a support and the hypotenuse 90 as a runway when the part E is used as an inclined passage from the ground-level to the main brooder-floor. In Fig. 1 the part E is illustrated in use as an exercising-room, the floor being held level by being supported on the longer side 89 of the support. In Fig. 4 the part E is illustrated in use as a means for connecting the floor-level of the brooder with the ground-level, the side 90 of the support leading to the lower edge of the floor 85 and the incline 7 leading from its upper edge to the main floor of the brooder.

Taking now into consideration some of the advantages of my brooder over any now on the market I might state that since the flame of my heater is turned so very low the brooder is to all intents and purposes fireproof. Even should the flame be turned up too high there is no exposed wooden part near the heated parts and the hot gases pass away in the smoke-pipes, which are directly under the cold-air pipes, so that the edge of the plate 42 is kept from overheating by the cold air directly over its hottest point. It is true that if the lamp is turned too high too much heat will be generated for the comfort of the chickens, which are, however, free to move away from the source of heat to a suitable temperature; but the danger from fire is reduced to a minimum. By placing my moisture-cup at the point where the hottest and driest air strikes it I place it in the most advantageous point and am able to return to the air the normal amount of moisture which it should contain.

I have found that by placing the feathers above the hover-cloth I am able to so closely imitate the effect of the pressure of a hen's body on the chickens that there is absolutely no tendency of the chickens to crowd in the corners of the brooder—in fact, unless there are too many chickens for the size of the hover the chickens act exactly as in the normal case of brooding with a hen.

What I claim, and desire to secure by Letters Patent, is—

1. In a brooder, the combination with a brooding-chamber, of a hover therein, a hover-cloth secured to said hover, a layer of feathers supported by said hover-cloth, a wire screen above said feathers and secured to said hover and adapted to keep said feathers in place, and means for conveying a supply of warm fresh air above said wire screen and to distribute it by said screen over a large surface of said layer of feathers said warm air passing downward through the feathers and the hover-cloth to the space beneath said hover.

2. In a brooder, the combination with a brooding-chamber having a floor, of a hollow cylinder supported vertically by said floor and having one or more rows of holes near

its upper end and a lower row of holes therein, a hover-board secured to and supported over the floor by said cylinder, a hover-curtain depending from said hover-board, a hover-cloth secured to said hover-board and to said hollow cylinder below said upper rows of holes therein, and means for conveying a supply of warm fresh air to the inside of the hollow cylinder said warm air passing through the holes therein and downward through said hover-cloth to the space between it and said floor.

3. In a brooder, the combination with a brooding-chamber having a floor, of a hollow cylinder supported vertically by said floor and having one or more rows of holes near its upper end and a lower row of holes therein, a hover-board secured to and supported over said floor by said cylinder, a hover-curtain depending from said hover-board, a hover-cloth secured to said hover-board and to said hollow cylinder between said upper and lower rows of holes therein, and means for conveying a supply of fresh warm air to the inside of said hollow cylinder the warmer part thereof passing through the upper rows of holes therein and downward through said hover-cloth and the cooler part of the air passing through the lower holes directly under said hover-cloth.

4. In a brooder, the combination with a brooding-chamber having a floor, of a hollow cylinder supported vertically by said floor and having one or more rows of holes near its upper end and a lower row of holes therein, a hover-board secured to and supported over said floor by said cylinder, a hover-curtain depending from said hover-board, a hover-cloth secured to said hover-board and to said hollow cylinder between said upper and lower rows of holes therein, a layer of feathers supported by said hover-cloth, a wire screen above said feathers and secured to said hollow cylinder and to said hover-board and adapted to keep said feathers in place, and means for conveying a supply of fresh warm air to the inside of said hollow cylinder the warmer part thereof passing through the upper rows of holes therein and downward through said wire screen said feathers and said hover-cloth and the cooler air passing through the lower row of holes directly under said hover-cloth.

5. In a brooder, the combination with a brooding-chamber having a floor, of a hollow cylinder supported vertically by said floor and having one or more rows of holes near its upper end, and a lower row of holes therein, a hover-board secured to and supported over the floor by said cylinder, a hover-curtain depending from said hover-board, a hover-cloth secured to said hover-board and to said hollow cylinder below said upper row of holes therein, a water vessel supported in said hollow cylinder and having evaporation-holes therein, and means for conveying a supply of

warm fresh air to the inside of said hollow cylinder said warm air coming in contact with said water vessel and being charged with moisture therefrom and passing through the
5 holes in said hollow cylinder and downward through said hover-cloth to the space between it and said floor.

6. In a brooder, the combination with a brooding-chamber having a fixed floor with a
10 central hole therein, of a removable floor fitting in said hole in said fixed floor and having a hole therein, of a hollow cylinder supported vertically by said removable floor and surrounding the hole therein and having one or
15 more rows of holes near its upper end, and a lower row of holes therein, a hover-board secured to and supported over the floor by said hollow cylinder, a hover-curtain depending from said hover-board, a hover-cloth secured
20 to said hover-board and to said hollow cylinder below said upper rows of holes therein, and means for conveying a supply of warm fresh air to the inside of said hollow cylinder
25 said warm air passing through the upper holes therein and downward through the hover-cloth to the space between it and said floor the cooler portion thereof passing through the lower holes directly to the under side of the hover-cloth thereby keeping the air un-
30 der the hover pure.

7. In a brooder, the combination with a brooding-chamber having a fixed floor with a central hole therein, a removable floor fitting in said hole in said fixed floor and having a
35 hole therein, a dome secured in the hole in said removable floor and having a hole in the apex thereof, a hollow cylinder supported vertically by said removable floor and surrounding the hole therein and having one or
40 more rows of holes near its upper end and a lower row of holes therein, a hover-board secured to and supported over the floor by said hollow cylinder, a hover-curtain depending from said hover-board, a hover-cloth secured
45 to said hover-board and to said hollow cylinder below said upper rows of holes therein, a warmed surface within said dome, and pipes leading from the outside of the brooder to the space between said warmed surface and said
50 dome and adapted to conduct fresh air to said warmed surface.

8. In a brooder, the combination with a brooding-chamber having a fixed floor with a central hole therein, a removable floor fitting in said hole in said fixed floor and having a
55 hole therein, a cylindrical sleeve secured in said hole and extending above and below said floor, a dome secured to the lower end of said sleeve and having a hole in the apex thereof said dome extending above and below said floor, a hollow cylinder supported vertically by said floor and surrounding said sleeve and dome and extending upward therefrom and having one or more rows of
65 holes near its upper end and a lower row of

holes therein, a hover-board secured to and supported over the floor by said hollow cylinder, a hover-curtain depending from said hover-board, a hover-cloth secured to said hover-board and to said hollow cylinder be-
70 low said upper rows of holes therein, a warmed surface within said dome, and pipes leading from the outside of the brooder to the space between said warmed surface and said dome and adapted to conduct fresh air to
75 said warmed surface.

9. In a brooder, the combination with a brooding-chamber having a fixed floor with a central hole therein, a removable floor fitting in said hole in said fixed floor and having a
80 hole therein, a cylindrical sleeve secured in said hole and extending above and below said floor, a dome secured to the lower end of the sleeve and having a hole in the apex thereof said dome extending above and below said
85 floor, a water vessel supported over the hole in said dome and having evaporation-holes therein, a hollow cylinder supported vertically by said floor and surrounding said water vessel said sleeve and said dome and extending
90 above said water vessel and having one or more rows of holes near its upper end and a lower row of holes therein, a hover-board secured to and supported over the floor by said hollow cylinder, a hover-curtain depending
95 from said hover-board, a hover-cloth secured to said hover-board and to said hollow cylinder below said upper rows of holes therein, a warmed surface within said dome, and pipes leading from the outside of the brooder to
100 the space between said warmed surface and said dome and adapted to conduct fresh air to said warmed surface.

10. In a brooder, the combination of a lamp-chamber below the center of the
105 brooder, a lamp supported therein independent of the flue, a flue supported over said lamp and extending upward therefrom through a diaphragm and into a dome, a diaphragm secured in said brooder and having
110 small holes therein near its center, a dome secured to the upper side of said diaphragm outside said small holes therein, and having its apex above the upper end of said flue, a smoke-pipe leading from the space below
115 said diaphragm to the outside, an air-pipe leading from the outside to the space above said diaphragm, an outer dome around and above said dome and having a hole in the apex thereof, and a hover supported over and
120 around said domes whereby the fresh warm air from the air-chamber is conveyed to the chickens thereunder.

11. In a brooder, the combination with a hover having a central hollow cylinder with
125 holes therein for warm air to pass to the backs of the chickens thereunder, of means for conveying a supply of fresh warm air free from the products of combustion to said cylinder, and a water vessel supported in the
130

stream of the warm air in said cylinder and adapted to allow the water to evaporate and to charge said warm air with the normal amount of moisture.

- 5 12. A brooder-chamber having a floor, the central section thereof being removable and having a hole therein through which a supply of fresh warm air may be conveyed from below said brooding-chamber.
- 10 13. In a brooder, the combination with a brooding-chamber having a fixed floor with a central hole therein, of a removable floor fitting in said hole in said fixed floor and having a hole therein, of a cylindrical sleeve secured in said hole and extending above and below said floor, a dome secured to the lower end of said sleeve and having a hole in the apex thereof said dome extending above and below said floor, a hollow cylinder supported vertically by said floor and having one or more rows of holes near its upper end, and a hover supported thereby and consisting of a horizontal board extending out from said cylinder and a hover curtain and cloth supported by said board.
- 15 20 25

14. In a brooder, the combination with a hover having a central hollow cylinder supported on the hover-floor and having holes therein for warm air to pass to the backs of the chickens thereunder, of a lamp supported centrally below the hover-floor, a diaphragm separating the space below said floor into a smoke-chamber below and a fresh-air chamber above, a closed dome extending into said fresh-air chamber and secured to the upper side of said diaphragm but communicating with said smoke-chamber by small holes through said diaphragm, a flue supported by and passing through said diaphragm over said lamp whereby the smoke and warm air are conveyed from said lamp and collected in said dome whereby the fresh air is warmed and passes into said central hollow cylinder.

30 35 40

Signed at Tacoma this 26th day of March, 1904.

HENRY F. RAU.

Witnesses:

WILLIAM E. WINDS
FREDERIC J. SHAW.