

Aug. 4, 1942.

E. HANBY

2,292,120

BABY INCUBATOR

Filed Oct. 24, 1940

2 Sheets-Sheet 1

Fig. 2.

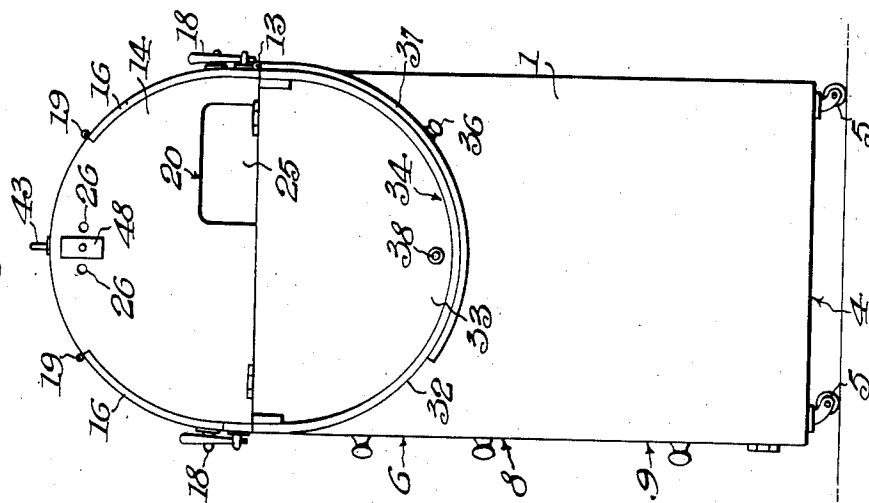
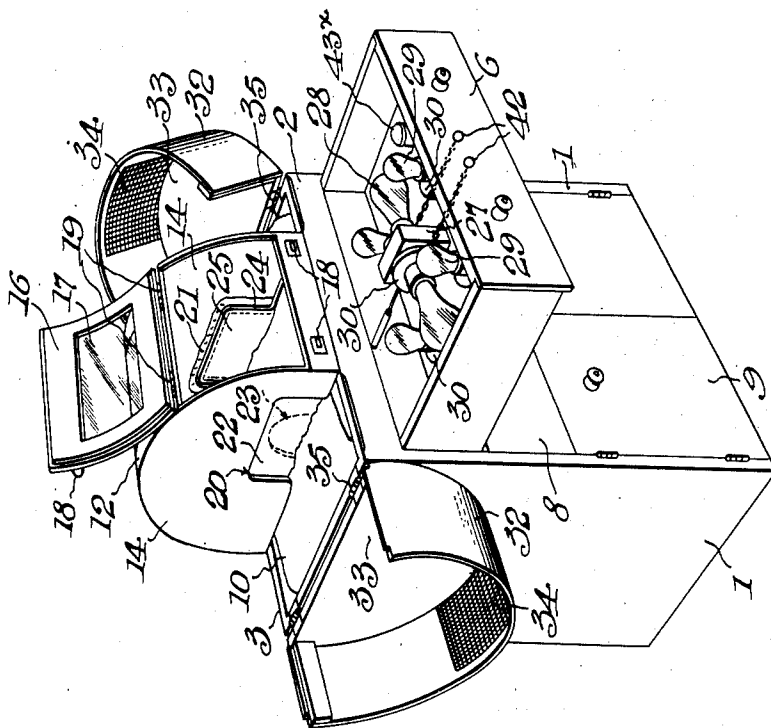


Fig. 1.



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2 Sheets-Sheet 2

Fig. 3.

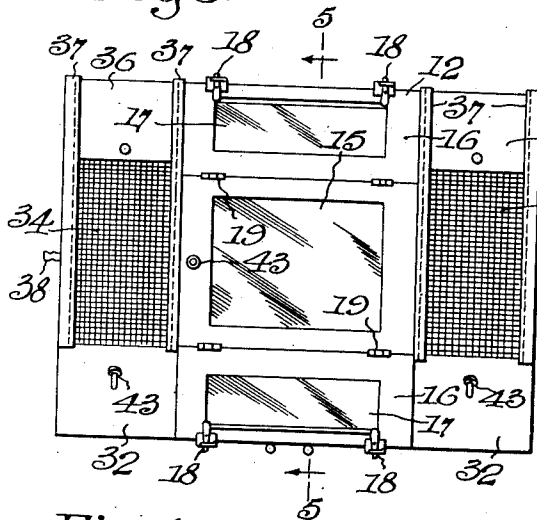


Fig. 5.

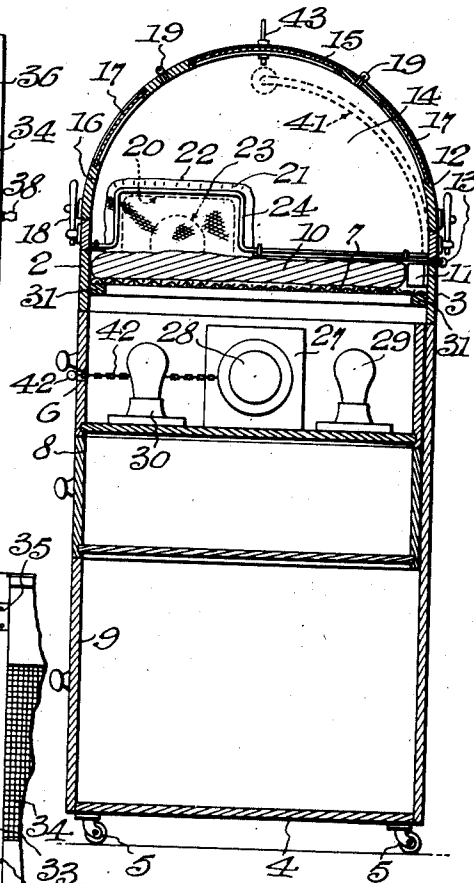


Fig. 4.

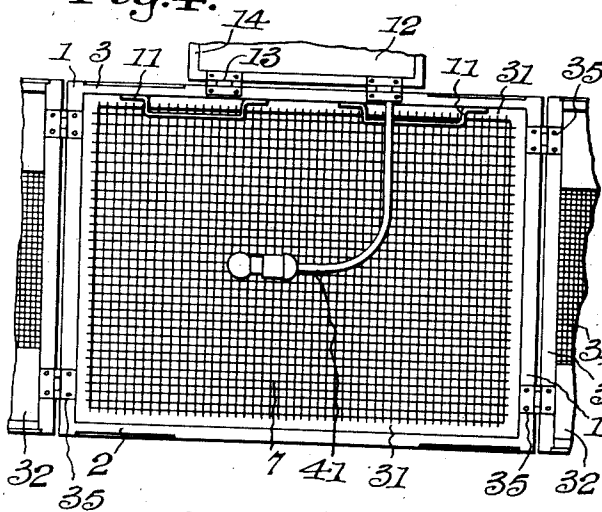


Fig. 6.

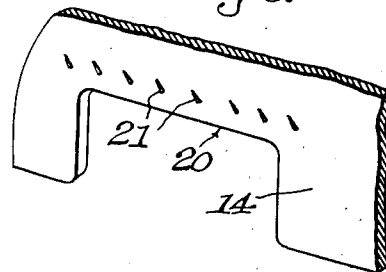
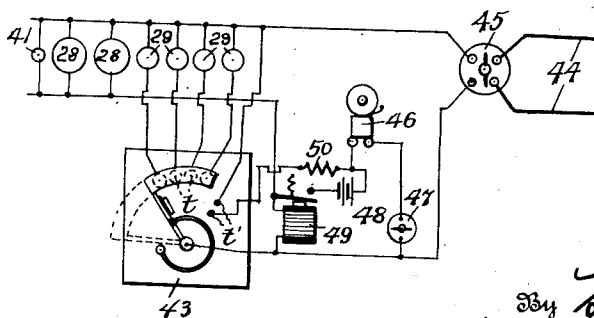


Fig. 7.



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UNITED STATES PATENT OFFICE

2,292,120

BABY INCUBATOR

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Application October 24, 1940, Serial No. 362,647

2 Claims. (Cl. 128—1)

My invention relates to a certain new and improved baby incubator, particularly for use in cases of premature birth.

The invention, among other things, has for its objects to provide an incubator of the character stated of such construction that the baby can be observed, fed and cared for generally without the necessity of opening up the device in such a way as to allow the heat to escape upward or away, making it possible to maintain a more uniform heat and to prevent the serious objection, found in most other incubators, of allowing the patient to become chilled, and to provide an incubator wherein more than one patient can be served at the same time.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends the invention still further consists in the novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, and then be particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which:

Figure 1 is a perspective view of an incubator according to my invention, the center section of the top being down, one end section opened entirely, and the other end section partly opened.

Figure 2 is an end elevation looking from right to left in Figure 1, but with the end section of the top swung fully down.

Figure 3 is a top plan view of the incubator.

Figure 4 is a top plan view of the same, the top being fully opened and parts broken away and the mattress removed.

Figure 5 is a vertical section on the line 5—5 of Figure 3, the location of the lamp bracket and lamp being indicated in dotted lines.

Figure 6 is an enlarged detailed perspective of a fragment of a wall 14 hereinafter referred to.

Figure 7 is a circuit diagram later again referred to.

In the drawings, in which like numerals of reference indicate like parts in all of the figures:

1 designates the side walls, 2 the front wall, 3 the back wall, and 4 the bottom of the cabinet proper. The cabinet may be, and preferably is, mounted on casters 5, shown best in Figures 2 and 5 of the drawings.

The cabinet is provided with a drawer 6, hereinafter termed the heater drawer. It also preferably has a drawer 8 for storage of materials

used in connection with the incubator and a bottom storage space closed by doors 9.

At the upper part of the cabinet proper, and below the top edge of the same, is located a frame 31 carrying a foraminous mattress support 7 on which lies a removable mattress 10.

Suitably located spacer brackets 11 are provided to prevent the mattress from entirely closing off the flow of heat by keeping the mattress 10 away from the wall or walls of the cabinet proper.

The top of the cabinet is composed of three sections, a central section 12, and two side sections 32 (see Figures 1, 3 and 4). The central section 12 of the top is hinged at 13 to the back wall 3 so that it may be swung upwardly and backwardly from the position shown in Figures 1 and 2 to the position shown in Figure 4. This central section has end walls 14, while the curved wall of the section is provided with a transparency or window 15 and at least one door 16, which door is hinged at 19 and can be opened independently of the rest of the central section 12 of the top. The door 16 is provided with suitable latches 18 for holding it shut. It also has a transparency or window 17. Through windows 15 and 17 the patient or patients can be readily observed. The door 16 is provided for the purpose of providing a means through which the patient may receive general care and ministration with the loss of only a minimum amount of heat.

The walls 14 of the central section 12 are provided with elongated openings 20 staggered with respect to one another and over the top of these openings are pins 21 (see particularly Figure 6) on which rubber curtains 22 may be hung, the curtains being held in place by a suitable wire frame or clamp member 24 around which gauze (not shown) can be fitted from time to time. The flexible rubber curtains are of sufficient width to drape around the neck of the patient and at the same time allow growth and freedom of motion. The form taken by the curtain when draped around the neck of the patient is indicated by dotted lines 23 in Figure 1. When one patient only is to occupy the incubator, the unused opening 20 is completely covered by a suitable curtain 25.

To provide for ventilation of the central compartment, holes 26 are provided which, when desired, may be closed by a pivoted member 48.

The side sections 32 of the top conform generally to the shape of the central section 12, but these side sections have but one wall 33 each.

The walls 33 are pivoted at 35 to the sides 1 instead of to the back wall 3, as is the central section. In this way the end sections 32 can be swung down to the sides 1 of the cabinet proper, as shown at the left of Figure 1 and as shown in Figure 2. These end sections 32 of the top have screened openings 34. They are also provided with sliding doors 36 operating in suitable guides 37 by means of which doors the openings 34 may be closed in whole or in part.

The side sections of the top are also preferably provided with nipples 38 to which a hose from an oxygen generator may be connected when it is desired to administer oxygen to the patient. Instead of using nipples 38 for connection to the oxygen generator hose (not shown), simple openings may be provided in the walls 14 through which the rubber hose from the oxygen source may be passed to deliver the oxygen into the end sections of the top.

The heat for the incubator is generated by two sets of electric lamp bulbs 28 and 29 respectively. The bulbs 28 are large bulbs, furnishing maximum heat and are preferably two in number and are mounted on brackets 39 on suitable supports 27. The bulbs 29 are of lesser heat capacity than the bulbs 28 and are mounted in sockets 30, there being four of the smaller bulbs 29 shown. The circuit containing the bulbs 29 may be controlled by a suitable thermostat 43^x located at any desired place in the drawer and there may also be provided an alarm arrangement controlled by the thermostat for setting off an audible alarm when the temperature reaches a certain predetermined maximum. Any suitable thermostat and any suitable maximum temperature signalling system may be employed. These, per se, are not of my invention; however, in Figure 7 I have diagrammatically shown a suitable arrangement.

Thermometers 43 (see Figs. 3 and 5) may be located at suitable places for indicating the temperatures in the compartments.

41 designates a lamp bracket with the light bulb located fixedly to be positioned within the central section 12 of the top when the same is closed. This bracket and lamp 41 are shown in full lines in Figure 4 and their position is indicated by dotted lines in Figure 5.

Pull chains 42 are provided by which the lamp bulbs 28 may be turned on and off from the outside of the drawer 6 (see Figures 1 and 5).

By reference to Figure 7 it will be seen that 44 represents the power lines, 45 the main switch, 46 an audible signal, 47 the cut-out switch for signal 46 when the same is not to be used, 48 a low voltage battery, 49 an automatic battery cut-out operated by main line current, and 50 a voltage reducer (resistance).

Normally the thermostat when switch 45 is open contacts all four terminals *t* to which bulbs 29 are connected.

If too much heat is generated, the thermostat cuts out one or more of the bulbs 29. If an excessive amount of heat is generated (as when a bulb or bulbs 28 are not turned off at the proper time), contact with terminal *t'* is made and main line current passes through audible signal 46 to operate the same.

While main line current is on, cut-out 49 keeps the battery circuit open. However, if main line current from the generating plant discontinues, due to breakage or other unforeseen causes, cut-out 49 closes the battery circuit through audible signal 46.

In using my incubator for a single infant, the opening 20 on the right-hand wall 14 of the central section 12 of the top is closed (see Figures 1 and 2) and the infant is positioned so that its neck will lie in line with the opening 20 of the left-hand wall. When two infants are being incubated both openings 20 are used and the second infant has its neck located in line with the opening 20 of the right-hand wall 14, the heads of the infants lying in the space enclosed by the end sections 32 of the top, while the bodies and legs of both infants are positioned within the space enclosed by the central section 12 of the top.

In placing the patient or patients, as the case may be, in the incubator, the three top sections are first opened fully and the patient or patients are placed upon the mattress 10. When two patients are placed in the incubator they are placed with their bodies in reverse positions. The central section 12 of the top is then closed down and after the curtains have been properly adjusted around the neck or necks the end sections 32 of the top are closed. Normally the sliding doors 36 are moved back so as fully to expose the screened openings 34. When current is turned on, the lamps 29 light up, as do also lamps 28 (when the chains 42 have been pulled to effect that condition). The bulbs 28 are only used to produce quickly the required amount of heat in the compartments, after which their use is discontinued by turning them off with the pull chains. The remaining bulbs 29 are continued in use for the constant heat and are controlled by the thermostat, as before stated.

In the drawer 6 there may also be placed a vessel or vessels of water in order that the air may acquire the desired humidity.

While I have shown but two mattress spacers 11, it is obvious that these spacers may be placed on all four walls of the incubator if desired so that the mattress may be kept clear of these walls all the way around.

The inner walls of the several compartments of the top may be furnished with a coat of aluminum paint to produce a reflection of the heat waves, and the compartments may be suitably heat-insulated, for example, with "Firtex."

Thermometers 43 are preferably provided and are located in the respective sections 12 and 32 at any suitable place so that the temperatures within the top compartments may be readily determined.

While I have primarily designed my apparatus as an infant incubator, it is obvious that it may be made on a larger scale for use by older patients and even adults in certain cases where this sort of treatment is required, such as in case of severe burns. In such cases there should be uniform heat maintained and no chilled air should be admitted. Of course, in the larger models the details of construction and arrangement of the upper and opening compartments may need to be modified accordingly.

Other modifications and changes in the details of construction will be obvious to those skilled in the art and can be made within the scope of the invention and the appended claims.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction, uses and advantages of the invention will be apparent to those skilled in the art.

What I claim is:

1. In apparatus of the class described, a cabi-

net proper having side walls, a front wall, a back wall and a bottom, a foraminous partition in the cabinet proper adjacent the top of the same, a mattress on said partition, means below said partition for generating heat, a top for said cabinet proper comprising at least two sections, one of said sections having a pair of side walls and a top wall, and being hinged to the back wall of the cabinet proper, the other top section having a side wall and a top wall conforming to the first top section, said other top section having its side wall hinged to a side wall of the cabinet proper, said other top section adapted to lie with its open side against a side of the first top section when the top sections are in place, the wall of the first top section which is adjacent said other top section having an opening, a flexible curtain held over said opening to go about the neck of a patient, with the head of the patient located in the space covered by said other top section and the body of the patient located in the space covered by the first top section.

2. In apparatus of the class described, a cabi-

net proper having sides, a front wall, a back wall and a bottom, a foraminous horizontal partition in the cabinet proper adjacent the top of the same, a mattress on said partition, heat generating and temperature controlling means in the cabinet and located below said partition, a top over said mattress and composed of a center section and two end sections, the center section comprising side walls and a top wall, said side walls each having a neck-opening, that of one side wall being staggered with respect to that of the other side wall, the top wall of said center section having a transparent window and a door, flexible curtains for embracing the necks of patients and held over said neck-openings, the end sections of the top each comprising an outside end wall and a top wall and being constructed to lie against said center section when the top is closed, said end sections each having an opening to atmosphere and means to hinge the several top sections independently to said cabinet proper.

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