

Jan. 2, 1945.

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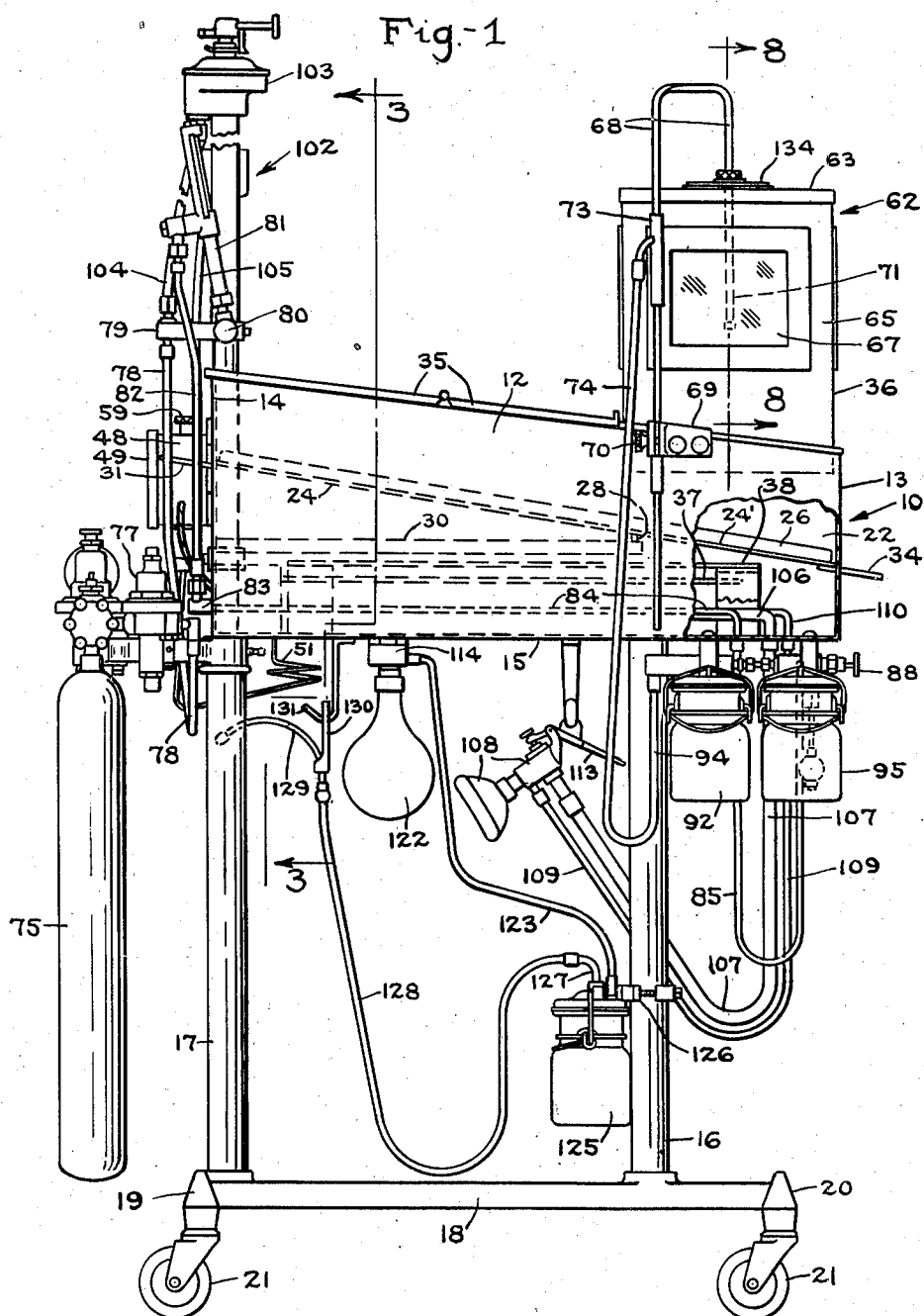
2,366,630

BASSINET ORGANIZATION

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5 Sheets-Sheet 1

Fig. 1



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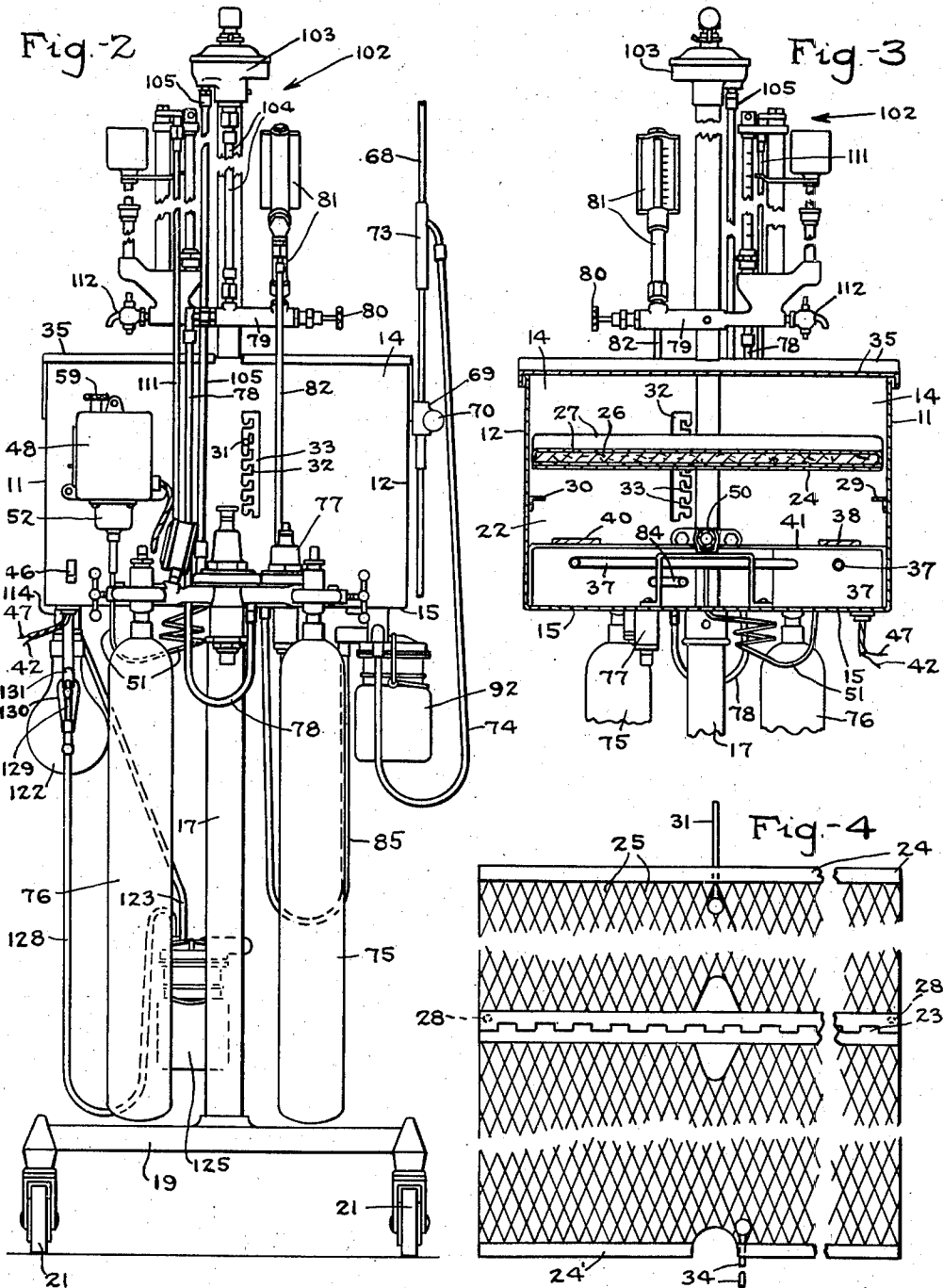
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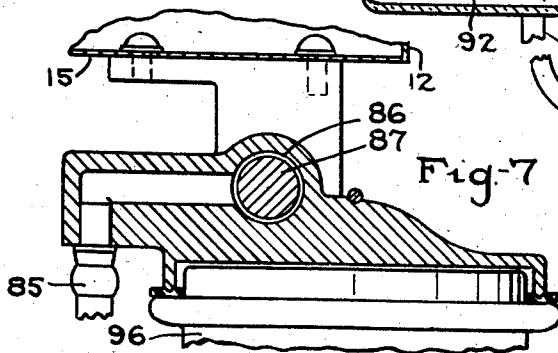
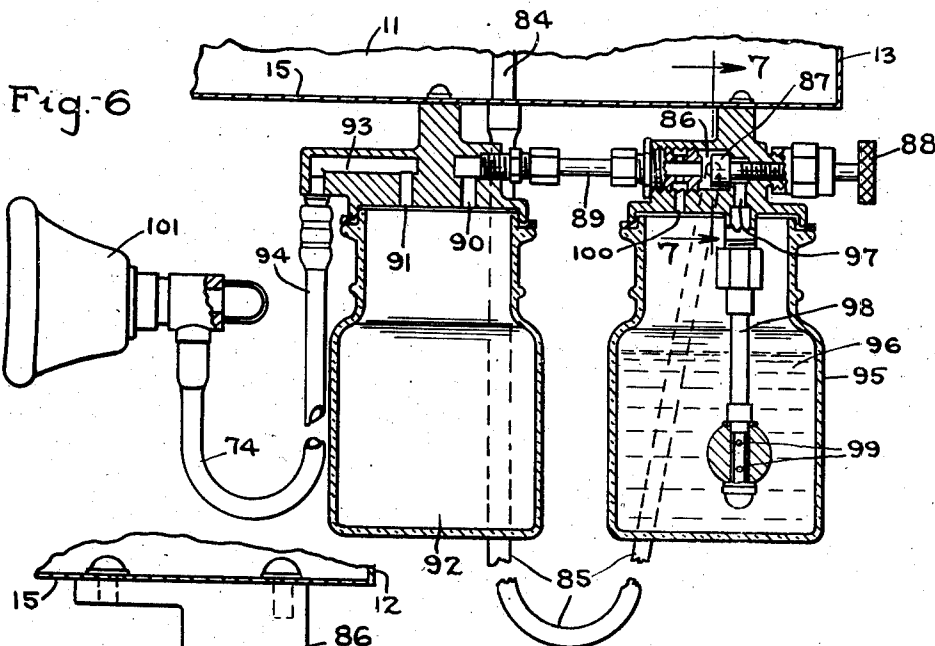
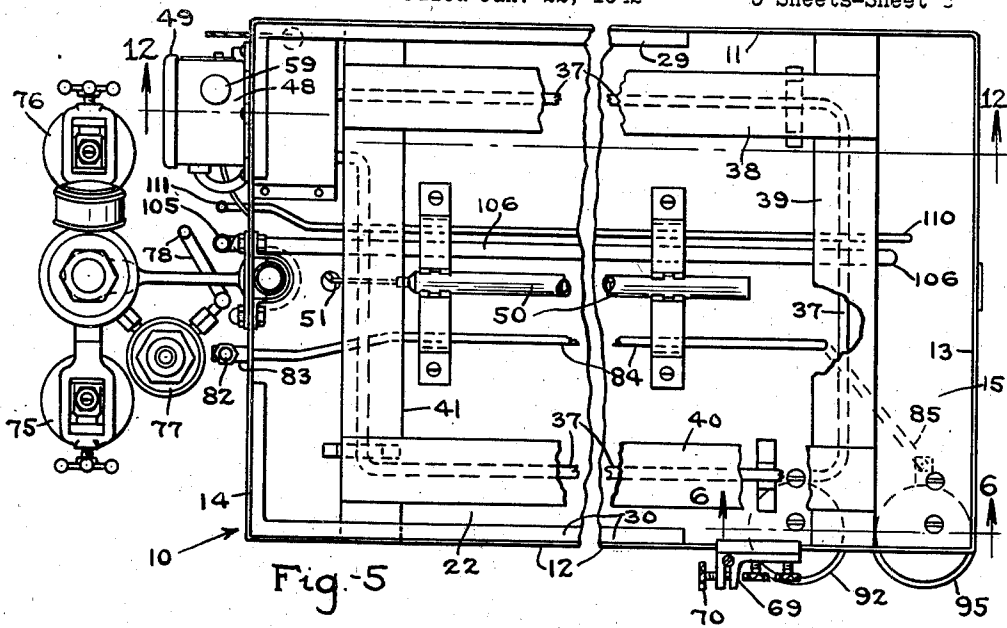
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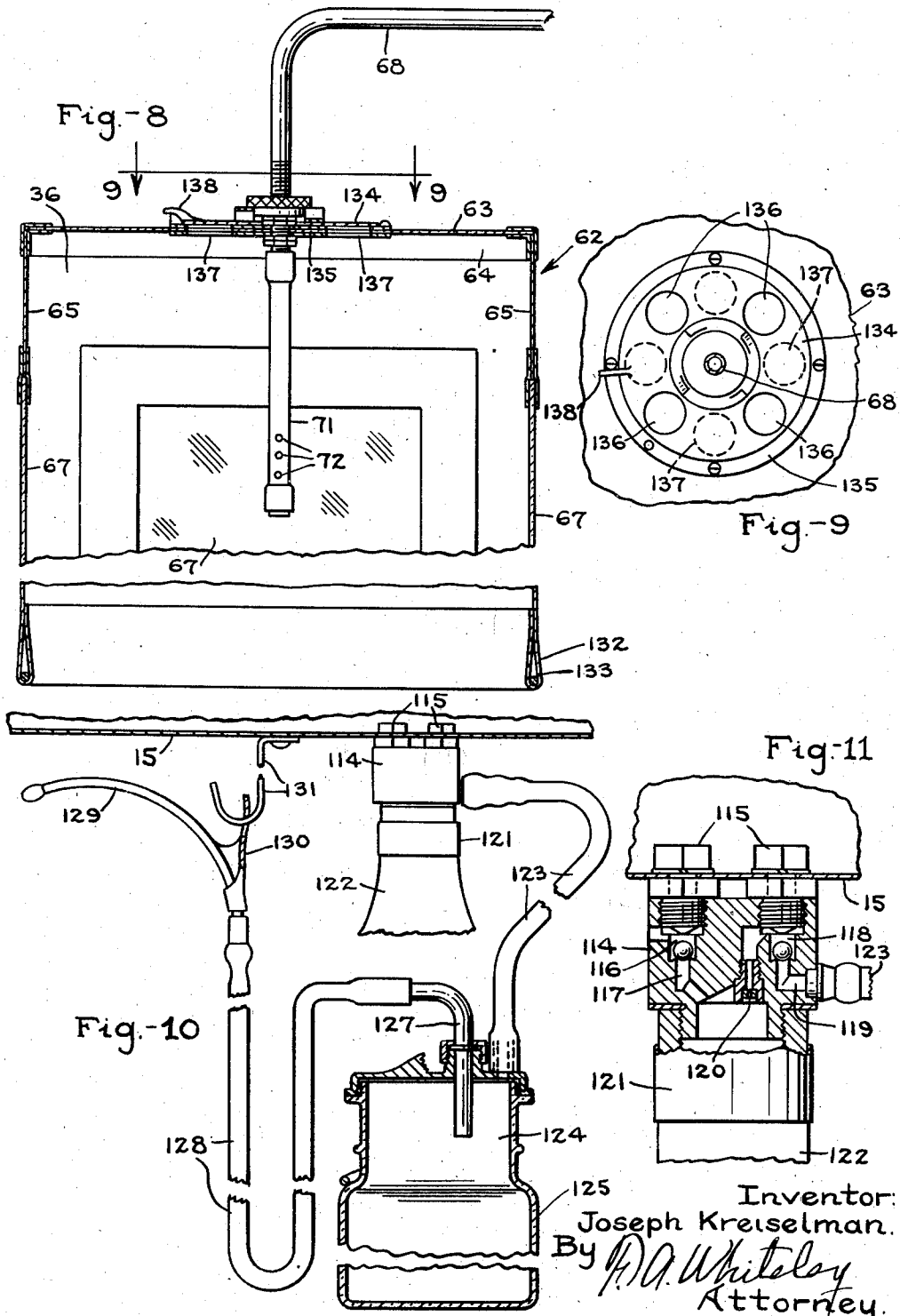
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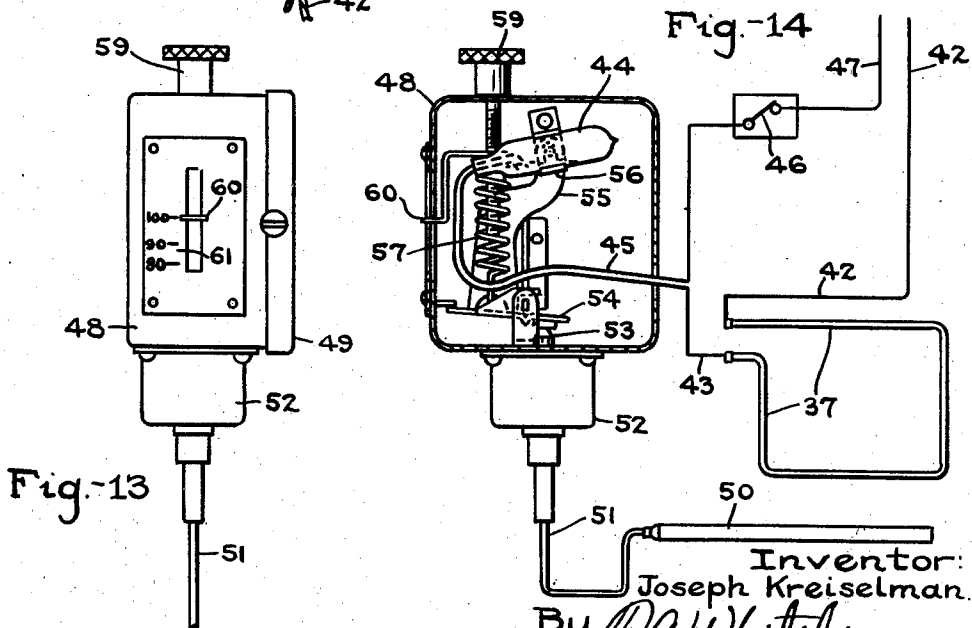
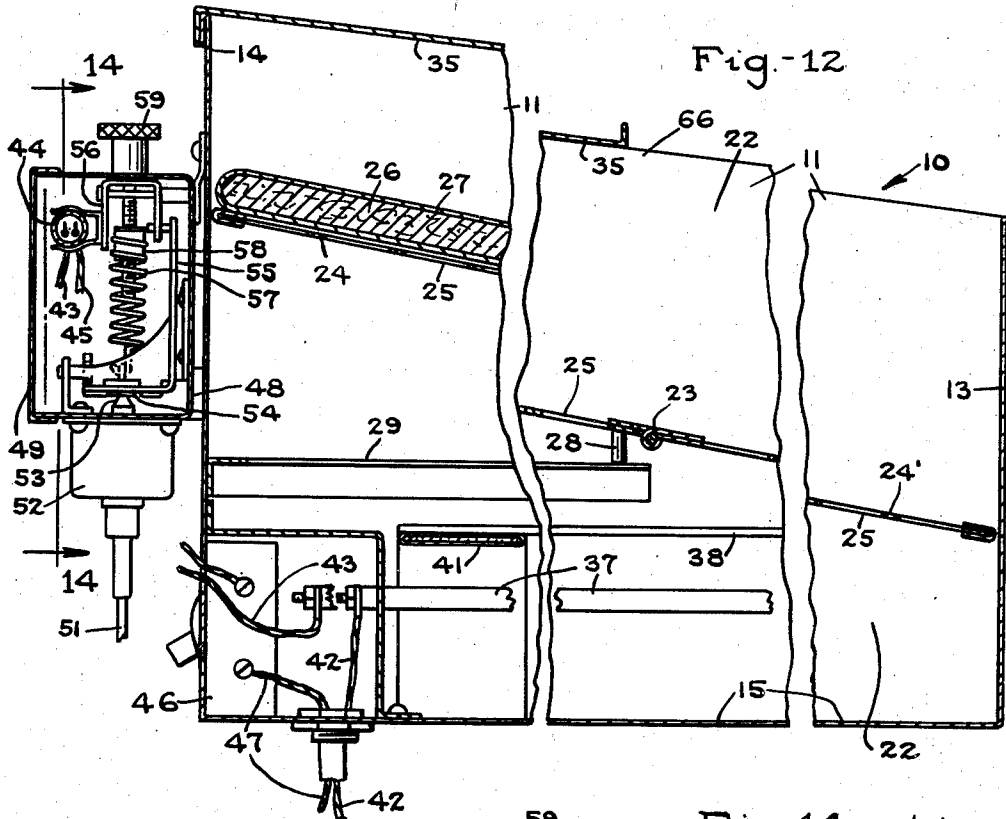
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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,366,630

BASSINET ORGANIZATION

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Application January 22, 1942, Serial No. 427,733

1 Claim. (Cl. 123—1)

My invention relates to a bassinet organization adapted for the care of infants, particularly new born babies, and has for its object to provide in an easily accessible and convenient form an adjustable means of supporting the infant in desired positions, means for properly tempering the bed on which the infant lies and the atmosphere surrounding the infant and for giving to it a suitable moisture content, means for withdrawing saliva or other accumulations from the mouth and other passages of the infant, means for giving to the infant an atmosphere suitably enriched with oxygen, and resuscitation means including oxygen supplying means for bringing about and establishing correct breathing by a new-born infant threatened with asphyxiation from breathing failure.

A percentage of infants are born which, either because of premature birth or for other causes, have a very precarious hold upon life and require special treatment of the most prompt and effective kind in order to be kept alive. Sometimes the breathing does not establish itself and asphyxiation impends. Under such conditions not only must resuscitation means be promptly applied to establish breathing but it must be under conditions where the least shock can result and under conditions where the proper temperature and humidity of surrounding atmosphere free from drafts will be present and at all times available. And in other cases, where breathing has been established normally but from other causes the life of an infant is threatened, similar conditions of freedom from shock, suitable support for the infant in an atmosphere of proper temperature and humidity and suitably oxygen-enriched, are called for.

It is a principal object of my invention, therefore, to provide a bassinet organization including the means broadly stated above, whereby an infant born in an abnormal condition from any cause so that extinction of life is threatened, can be immediately positioned where shock is avoided and any and all of the instrumentalities for bringing it to normal condition are conveniently and immediately available.

In carrying out my invention herein described and claimed I have employed among other things the resuscitation apparatus of patents to Robert B. Swope and myself, Numbers 1,848,232, 1,848,233 and 1,848,234, all granted on March 8, 1932, for resuscitation apparatus and special inhaler used therewith, in combination with a bassinet chamber with means for adjusting the positioning of the infant therein and various instrumentalities

for supplying oxygen, properly heating and humidifying the atmosphere within the bassinet chamber and supplying oxygen to the infant where that is called for.

The full objects and advantages of my invention will appear in connection with the description given in the following specification and the novel features by which are obtained the valuable and advantageous results above referred to will be particularly pointed out in the claim.

In the drawings illustrating an application of my invention in one form:

Fig. 1 is a side elevation view of a bassinet organization embodying my improvements thereto.

Fig. 2 is an end elevation view taken from the left of Fig. 1.

Fig. 3 is a section taken on line 3—3 of Fig. 1.

Fig. 4 is a partial plan view showing the form of the screen support within the chamber of the bassinet.

Fig. 5 is a top partial plan view of the bassinet partly in section and with some parts broken away and with the cover and other parts removed.

Fig. 6 is a sectional elevation view on an enlarged scale of the humidifying apparatus taken on line 6—6 of Fig. 5.

Fig. 7 is a sectional elevation view on a still further enlarged scale taken on line 7—7 of Fig. 6.

Fig. 8 is a sectional elevation view of the oxygen tent arrangement alone showing how the flaps are carried down into the chamber of the bassinet taken on line 8—8 of Fig. 1.

Fig. 9 is a partial sectional plan view lying under the section line 9—9 of Fig. 8.

Fig. 10 is an enlarged part sectional elevation view of the means for withdrawing mucus and saliva from the air passages of the subject in the bassinet.

Fig. 11 is an enlarged sectional view of the check valve structure of the mechanism illustrated in Fig. 10.

Fig. 12 is an enlarged partial longitudinal sectional elevation view taken on line 12—12 of Fig. 5.

Fig. 13 is a side elevation view of the heat control box indicated at the upper left of Fig. 5.

Fig. 14 is a wiring diagram including a sectional view of the heat control casing taken on line 14—14 of Fig. 12.

As illustrated my invention comprises a box-like supporting body designated generally as 10 which comprises side walls 11 and 12, end walls 13 and 14, and a bottom wall 15. This support-

ing casing is mounted upon a pair of centrally disposed posts 16 and 17, Figs. 1 and 2, which in turn are rigidly connected with a base frame formed of a central bar member 19 and a pair of cross frame members 19 and 20 on which are mounted caster wheels 21, enabling the assemblage to be readily moved from place to place.

A shelf member is formed of two sections 24 and 24' hingedly connected together at 23 and located within the chamber 22 formed by the side, end and bottom walls above referred to. This is an open mesh support which permits heat generated in a manner hereinafter described to pass through its openings 25 to the pad 26, of suitable porous material, which is enclosed within a cover member 27, whereby the infant supporting member itself as well as the space above it are suitably heated. The support 24 is provided with a pair of pins 28 which are adapted to engage angle iron shelves 29 and 30 secured to the side walls 11 and 12 upon which the entire assemblage may be rocked to put the supporting pad 26 in any desired angular position. This member is held in adjusted position by means of a finger 31, Fig. 4, which goes through a slot 32 in end wall 14 and takes in the notches 33 along said slot, Figs. 2 and 3. Similarly the lower end of the mesh support 24 is provided with a finger member 34 which takes into a similar slot and notches (not shown) to adjust the member 24 and the hinged part 24' in different angular positions relative to the part 24.

This arrangement is such that the baby's support as a whole may be disposed at any desired angle to the horizontal and the portion 24' thereof may be disposed at any desired angle to the portion 24. At the same time the entire arrangement is such as to permit the reception of heat from below the pad 26. A cover 35 is normally placed over the rear portion of the compartment 22, as best shown in Figs. 1 and 12. This cover tends to retain heat toward the foot of the baby holding compartment of the bassinet while the part at the front, as indicated in Fig. 12, is open neither to the air of the room or to an oxygen tent 36 which will be later described in detail.

To furnish the heat above indicated an electric heating element 37, as best shown in Fig. 5, is carried in a substantial rectangle underneath a series of guard plates 38, 39, 40 and 41, located in the lower part of chamber 22, as clearly shown in Fig. 3. The guard plates above referred to receive the direct radiation from the heating element 37. This effects heating largely by convection, which keeps the outside walls warm, thus preventing cold drafts, and dissipates the heat throughout the bottom portion of the chamber from which the heat rises to pass through the open mesh supporting members 24, 24' and through and about the supporting pad 26.

As shown in the wiring diagram of Fig. 14 the main supply current wire 42 goes to the heating element 37. A branch wire 43 goes through a mercooid switch 44 from which leads a second branch wire 45 which passes through manual switch 46 to the second main current supply wire 47. The mercooid switch is located within a thermostat control box 48 which is closed by a cover member 49 which gives access to the interior thereof. The thermostat is of a well-known gas expansion type wherein the expansion member 50 is connected by a tube 51 with a diaphragm chamber 52 adapted to move a piston

head 53 into engagement with a lever arm 54 which has a long arm 55 adapted to rock the holder 56 for the mercooid switch 44 to turn the switch on and off in a well known way. A spring 57 is tensioned more or less by a follower 58 operated by a thumb screw 59, the follower being provided with a pointer 60 which indicates desired temperatures on a scale 61.

This arrangement is such that a maximum temperature may be automatically maintained in the part of the chamber 22 below the supporting pad 26. This maximum temperature should be such as will result in heating the pad 26 on which the infant lies and the atmosphere above the infant to a desired temperature. When this part of the chamber is employed for receiving an infant just born this temperature of the pad upon which it is to be laid and the atmosphere surrounding it should be substantially that of the body temperature surrounding it before birth, that, between 98° and 99° F. It has been found that to produce this temperature at the supporting surface of the pad and in the atmosphere above it, a maximum temperature below the pad and controlled by the thermostat should be around 100° F.

Under most conditions, except when the apparatus is used for resuscitation purposes, an oxygen tent 62 will be employed and have suitably tempered oxygen delivered thereto. The oxygen tent is shown in detail in Figs. 1 and 8. The tent comprises a top 63 formed of rigid material with double flange members 64 which support a set of flexible walls 65 adapted to extend through the open portion 66 at the front of the bassinet, as indicated in Fig. 1. A loop 132 is formed at the bottoms of the tent walls in which is inserted a formed wire 133 which holds the bottom of the oxygen tent in position within chamber 22. The several walls of the flexible tent portion are provided with transparent portions 67 which gives the nurse a ready view of the infant within the chamber 22 of the bassinet. The top 63 of the tent is provided with a pair of valve plates 134 and 135 formed with sets of openings 136 and 137, Fig. 9. The top plate 134 may be rotated by means of a handle 138. By this means a ventilating top opening of greater or less extent, as desired, may be provided. The oxygen tent is supported with its open bottom extending a desired distance into chamber 22 by means of a tubular member 68 which passes through a clamping device 69 secured to the side wall 12 of the bassinet and operated by means of a thumb screw 70 whereby the oxygen tent 62 may be held in any desired position as adjusted for height.

The supporting member 68 comprises a tube which is in communication with an oxygen delivery tube 71 extending for some distance inside of the tent, with openings 72 for permitting flow of oxygen laterally from the tube into the tent. A connector member 73 on supporting member 68, Figs. 1 and 2, customarily is united with an oxygen supply tube 74. The oxygen is fed from either of two tanks 75 or 76 through a regulating valve 77 of well known construction. From the valve 77 the oxygen goes by means of a pipe 78, Figs. 1 and 2, to a manifold passageway 79 controlled by a valve 80. In the course of its travel from valve 77 along pipe 78 to manifold passageway 79 the oxygen may be heated as desired, preferably by electric heating means, not shown. From the passageway 79 the oxygen gas 75 passes through a flow valve 81 and thence through

a tubular passage 82 through a connection 83 and a transverse tube 84, Fig. 1, and depending loop 85 into a valve chamber 86, Fig. 6. A valve 87 controls the flow of gas from valve chamber 86, the valve being controlled by a thumb screw 88.

In the position of the valve of Fig. 6 the oxygen gas will pass directly through pipe 89 through openings 90 and 91 into the top of a jar 92 and from opening 91 through an opening 93 which leads to a tube 94 connected with the tube 74 heretofore described. The casting which forms the valve chamber 86 has secured thereto a container 95 having therein a quantity of water, as indicated at 96 Fig. 6. When the valve 87 is moved by the thumb screw 88 to a position for closing direct connection with pipe 89 the oxygen will flow through an opening 97 and a tube 98 to discharge through a series of apertures 99 into the body of water 96. The oxygen will bubble through this water and pass through passageway 100 to the tube 89. The reversal of the gas through container 92 at passageways 90 and 91 results in precipitation of any free water which might be entrained with the gas bubbles. This arrangement not only supplies oxygen gas to the oxygen tent as desired but also suitably humidifies the oxygen and the atmosphere breathed by the infant.

It may be desirable under certain circumstances to deliver fully free oxygen directly to the patient. For this purpose the tube 74 may be disconnected from the connector member 73 and connected to the infant inhaler 101, as indicated in Fig. 6, and the oxygen gas either as delivered from the tank or humidified may be administered directly to the infant.

Associated with the same oxygen supply and control means as that which supplies oxygen direct to the oxygen tent or to the infant, is a resuscitator apparatus designated generally by the arrow and reference character 102. This resuscitator apparatus is that of Letters Patent No. 1,848,232 and No. 1,848,233, above referred to and need not be described in detail further than to point out that oxygen is fed to the main control valve 103 through a pipe 104 from the passageway 79. Further that the feed of oxygen from the control valve 103 goes through pipe 105 to a feed pipe 106 which in turn connects with a flexible tubing 107, Fig. 1, having direct connection with a special inhaler device 108 which is substantially the same as the inhaler device disclosed in patent to myself and Swope, No. 1,848,232. The pressure of the gas forced under pressure into the lungs of the infant is controlled by a return tube 109, Fig. 1, which connects with tubing 110. The tubing 110 in turn connects through a pipe 111, Figs. 2, 3 and 5, which constitutes the pressure stabilizing mechanism of the resuscitator 102. This, as described in the said patents above cited, includes a column of water adjustable as to height. A faucet 112 is adapted to drain off this water.

In the use of this resuscitator apparatus the special inhaler structure 108 is applied over the mouth and nose of the infant, and lever 113 connected therewith is operated to allow oxygen under pressure which is regulated as a safe pressure to flow into the lungs. The lever 113 is thus released and the doctor or nurse expels the oxygen by pressure upon the chest and lungs of the infant. In this manner where prompt application of the resuscitator is made without undue shock, infants, whose life otherwise would quickly end, are resuscitated and saved.

Under certain conditions it may be necessary to remove from the breathing passages of the infant accumulations of slime and mucus, which unless quickly removed might cause serious and even fatal choking. In order to have such an apparatus available for instant use I provide the construction indicated in detail in Figs. 1, 10 and 11. A valve casing 114 is secured to the bottom wall 15 as indicated at 115 of Fig. 11. Within the casing are formed an outlet chamber and valve 116 normally blocking an outlet air passageway 117, and an inlet chamber and valve 118 normally blocking an inlet passageway 119. The valve chamber 118 extends to a very small opening 120 leading through the connector neck 121 to within a collapsible bulb 122. From the inlet passageway 119 leads a tube 123 which enters a deposit chamber 124 in a receptacle 125, as clearly shown in Fig. 10, said receptacle being secured by clamping means 126 to the post 16. From the chamber 124 leads a connector member 127 which extends through the cover of the receptacle 125 some distance inside the same and which is connected by means of a tube 128 with a catheter suction tube 129. The catheter has secured thereto a looped member 130 which is adapted to hang the same upon a hook 131 fast on the bottom wall 15.

With this arrangement the catheter can be inserted into the throat or nostrils of the infant and by successive squeezings of bulb 122 the mucus or other clogging matter can be withdrawn. The valves 116, 118 of course prevent any undue or dangerous pressure to the throat or mouth passages of the infant upon squeezing of the bulb. Where desired a small motor building up the desired negative pressure can be employed in place of the bulb 122.

Among the advantages of my invention particularly to be mentioned are the provision of immediately available means for establishing the life of a new-born infant and safeguarding the lives of those new-born infants in any degree subnormal. Under even the best of hospital conditions the new-born baby comes to light in an atmosphere at a temperature far below the temperature under which the infant has lived to the time of birth. Generally speaking, bedding, blankets, or other articles in which the infant may be wrapped are at that lowered temperature. Contacts with air or other matter at those lowered temperatures are sure to produce a degree of shock. A strong and lusty baby can endure it without too serious consequences. Not, however, a premature or other subnormal infant, for whom any degree of shock might easily prove disastrous.

With the heating arrangement provided by my bassinet organization the new-born infant can be placed upon a support and in an atmosphere heated to slightly above 98° F. where he will breathe air or oxygen-enriched air or oxygen at that temperature. This avoids that shock which with the premature or subnormal infant might result fatally. With the infant whose breathing does not establish itself this avoidance of shock in connection with the use of known resuscitator appliances tremendously increases the chances that normal breathing may be established and the life of the infant be saved.

But my resuscitator organization also provides the means for sustaining and building up the life forces of prematurely born infants or those who are subnormal for other reasons. For it contains all of the necessary means to treat any condition

of a new-born infant or one whose slender thread of life easily may be snapped thereafter. In this connection the instant availability of oxygen while the infant is supported upon a suitably heated pad in a suitably heated atmosphere, either for direct delivery to the lungs or breathing of the infant or for enriching the atmosphere which the infant breathes, is of extreme importance.

So too, instant availability of humidification of the atmosphere which the infant breathes may play a part in saving the infant's life. All of these instrumentalities may, and frequently do, cooperate to that end. My invention resides not merely in the fact that the instrumentalities are provided, but that they are provided in such juxtaposition and cooperative relationship that each or all of them may be used with the utmost dispatch while the infant is kept in a condition fully protected from shock. My invention is not merely the provision of oxygen-supplying means, resuscitator means and the like, but the provision of these means where any or all of them is and are available for instant use upon an infant positioned, warmed and guarded so that any such use will be possible without complications result-

ing from shock caused by other and extraneous conditions.

I claim:

In a bassinet organization, a portable body member forming an inclosed chamber, porous means therein positioned toward the center of the chamber for supporting an infant, thermostatically controlled electric heating means to heat said porous means and to maintain a predetermined high temperature within the chamber, a source of oxygen supply, an oxygen receiving manifold, means for delivering oxygen from said supply thereto, means for controlling the delivery pressure of the oxygen as it is delivered to the manifold, a set of piping to conduct oxygen from the manifold to the chamber for increasing the oxygen content of the atmosphere normally breathed by the infant, another set of piping for delivering oxygen from the manifold directly to the lungs of the infant, said oxygen delivery being effective simultaneously through both sets of piping, and means associated with said direct delivering means to cause the oxygen therefrom to be delivered in controlled pulses for resuscitating the infant.

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