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W. C. SANCTUARY ET AL

BROODER

Filed June 14, 1924

Fig. 1.

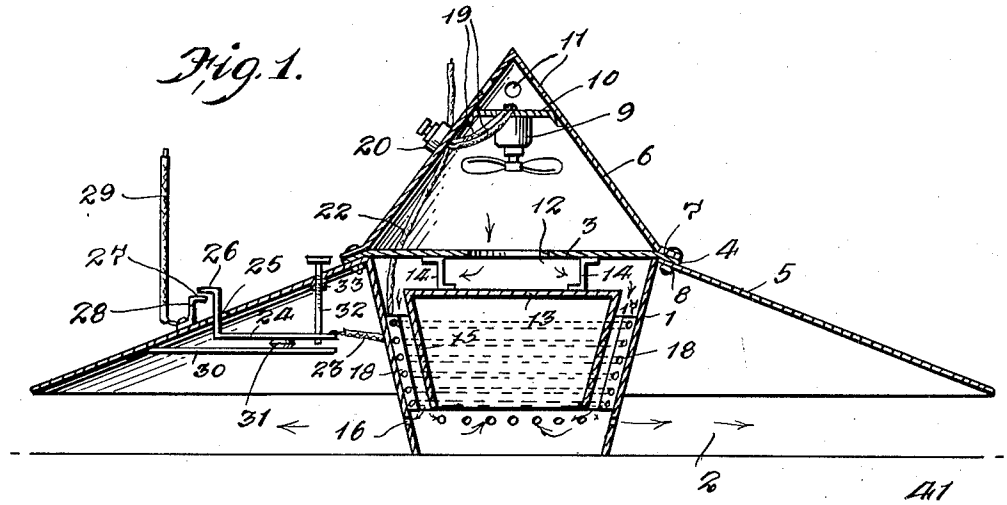


Fig. 3.

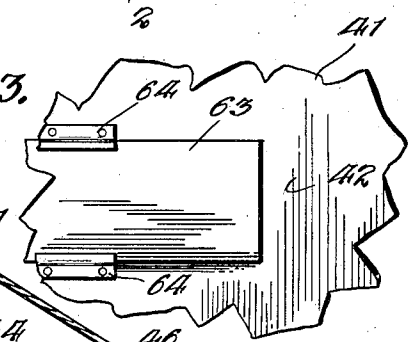
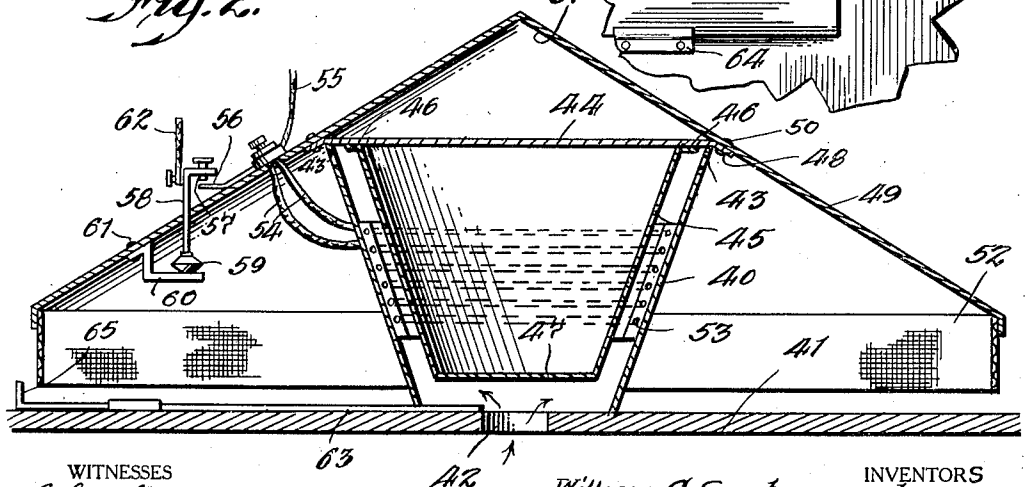


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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BROODER.

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Our invention is an improvement in brooders, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of the invention is to provide a brooder which affords facilities for maintaining the correct temperature for chicks over a relatively great area and for producing a temperature gradient which increases gradually and regularly from the outer edge of the hover of the brooder to a central source of heat.

A further object of the invention is to provide a brooder which has means for protecting the chicks which are sheltered thereby from incoming currents of cold air.

A still further object of the invention is to effect an economy in the use of fuel for heating to a satisfactory temperature a given space.

Other objects and advantages will be apparent from the following description, considered in conjunction with the accompanying drawings, in which

Figure 1 is a vertical section through one form of brooder embodying the invention,

Figure 2 is a vertical section through a second form of brooder embodying the same invention,

Figure 3 is a fragmentary plan view showing a portion of the structure exhibited in Figure 2.

The brooder exhibited in Figure 1 comprises a casing having a body section 1 which has substantially the shape of an inverted frustum of a cone. The body section 1 is adapted to rest at its lower and smaller end upon a floor 2 or like supporting surface and is provided at its upper end with a top plate 3. The top plate 3 may be secured to the body section 1 in any suitable known manner, as by welding, and has a marginal edge portion indicated at 4 which extends outwardly and downwardly from the upper end of the body section 1. A substantially frusto-conical hover plate 5 has a central opening adapted to receive the section 1 so that the hover plate may be lifted in encircling relation to the body portion 1 until the inner edge portion of the hover plate rests flatwise against the under side of the extending marginal portion 4 of the top plate 3 and the wall of the central opening of the cover plate is in close contact with the body section 1 at the upper end of the latter. The top section 6 of the casing of the brooder preferably is of conical form and has the marginal edge portions thereof turned outwardly as indicated at 7 to rest flatwise upon the upper side of the extending marginal portion 4 of the top plate 3. The lapped portions of the top section 6, the top plate 3 and the hover plate 5 are secured together by suitable fastening devices, such as the bolts and nuts indicated generally at 8.

An electric fan 9 is supported by a bracket 10 within the top section 6 in such position that the operation of the fan will cause suction through air inlets 11 which are formed through the top section 6 adjacent to the upper end of the top section and will force air from the space within the top section 6 through a central opening 12 in the top plate 3 into the body section 1.

A baffle within the body section 1 has the form of a hollow casing comprising a top plate 13 suspended by brackets 14 from the top plate 3 in spaced relation to the latter and a frusto-conical body 15 which depends from the plate 13 in spaced concentric relation to the body section 1. The body 15 terminates at its lower end short of the lower end of the body section 1 and slightly above the level of a circular series of spaced apart openings 16 which are formed through the lower end portion of the body section 1. An annular space 17 thus is produced between the body 15 of the baffle casing and the body section 1 through which air may pass from the space between the plates 3 and 13 to and through the openings 16 to the space beneath the hover plate 5. The fan 9 is connected electrically as at 19 with a switch 20 which may be of any suitable known type of construction and which in turn is adapted for connection with any suitable source of electric current supply. An electric heating element, such as that indicated at 18, is disposed within the space 17 and may surround the body 15 of the baffle casing. The heating element is connected to a conductor 22 which may lead to any suitable source of electric current supply. The heating element 18 also is connected by a conductor 23 to a movable spring arm 24 which is disposed within the cover and has an upstanding end portion extending loosely through an opening 25 in the cover plate and provided at its upper end with a contact 26 for cooperating with a con-

tact 27 on a stationary arm 28 which is attached to the hover plate and is connected to a conductor 29. The conductor 29 is adapted to lead to the source of electric current supply with which the conductor 22 is connected.

A spring arm 30 which is attached at one end to the hover plate 5 and extends in underlying relation to the arm 24 provides a stop against which a vertically expansible temperature responsive member 31 reacts. The arm 24 is adjustably supported by means of an adjusting screw which is threaded through an opening in the inner end portion of the arm 24 and is in abutting relation at its lower end with the upper side of the inner end portion of the spring arm 30. The adjusting screw 32 is rotatable and slidable in a vertical opening 33 in the hover plate 5. The adjusting screw 32 rests at its lower end upon the spring arm 30. As the temperature rises beneath the hover plate 5, the temperature responsive element 31 will expand and will react against the spring arm 30, thus causing vertical movement of the outer end portion of the arm 24 and lifting the contact 26 from contact with the stationary contact 27. The temperature at which the contact 26 will be moved out of engagement with the contact 27 may be varied by manipulating the adjusting screw 32 to vary the distance between the arms 30 and 24.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. Cool air will be drawn through the inlet 11 into the section 6 which constitutes a fan housing and will be forced from the latter through the opening 12 into the space within the body section 1, which may be termed a heater drum. The openings 16 are relatively small so that a slight back pressure will be provided within the heater drum and not only will the air be thoroughly warmed before being permitted to pass from the openings 16 to the space under the hover plate but the warm air will be distributed uniformly about the entire circumference of the heater drum.

The chicks beneath the hover plate thus will be protected from drafts of cool air because of the outward direction of the warmed air, particularly at and near the edge of the hover plate and the temperature beneath the hover plate will increase gradually and regularly from the outer edge of the hover plate toward the heater drum. As a result, the capacity of a brooder of a given size is increased beyond the ordinary when a brooder embodying the invention as herein described is used and the brooder may be located in a cooler room than is usual, which is a very desirable feature for the growth of vigorous, hardy chicks. The maximum temperature beneath the hover plate may be regulated by the thermostat which has been hereinbefore described and since the switch at 26, 27 will be opened when a desirable and predetermined temperature beneath the hover plate has been exceeded.

In the form of the device exhibited in Fig. 2, the heater drum is designated 40 and rests at its lower end upon a floor or platform 41 with the space within the heater drum directly above an opening 42 in the supporting floor or platform. The heater drum 40 is provided adjacent to its upper and larger end with a circumferentially extending series of spaced apart openings 43. A cover plate 44 closes the heater drum at its open end and supports the baffle member 45 which is attached at 46 to the cover plate and depends within the heater drum nearly to the lower end of the latter in spaced relation to the inner wall of the heater drum. The hollow baffle member 45 is closed at its lower end as indicated at 47. The cover plate 44 extends beyond the outer wall of the heater drum at the upper end of the latter thus producing an extending marginal portion 48 which is downwardly inclined and which supports a conical hover 49. The latter rests upon the attaching portion 48 of the cover plate 44 along a line located approximately midway of the height of the hover and is attached to the attaching portion 48 by bolts 50 or like fastening devices, whereby a closed space indicated at 51 is provided between cover plate 44 and the upper portion of the conical member 49 and the remaining portion of the conical member 49 overlies the space which surrounds the heater drum 40. The lower end of the hover 49 is supported above the level of the supporting floor or platform 41. A skirt indicated at 52 may be secured to the lower edge portion of the hover 49 and depends from the latter nearly to the floor or platform. The skirt 52 is made of a suitable flexible material, such as a heavy fabric.

Electric heating elements 53 disposed within the space between the baffle 45 and the heater drum 40 are connected electrically by conductors 54 to a push button switch which has one side thereof connected to a conductor 55. The conductor 55 may extend to any convenient source of electric current supply. The other side of the push button switch is connected electrically to a stationary contact 56. A movable contact 57 for cooperating with the contact 56 is adjustably supported on a vertically movable member 58 which is supported at its lower end upon an element 59 which is adapted to expand and contract in response to temperature changes within the space beneath the lower end portion of the hover 49. The thermostatic element 59 is supported upon a bracket 60 which is secured as at 61 to the

lower end portion of the hover 49 and depends from the latter. The contact carrying member 58 is provided with a conductor 62 which may lead to the same source of electric current supply to which the conductor 55 extends.

The opening 42 is the inlet for air and the volume of air permitted to pass therethrough into the heater drum 40 can be varied by manipulating a slidable shutter plate 63 which works in guides 64 upon the floor 31 and extends beyond the outer edge of the hover 49. A handle 65 at the outer end of the shutter plate can be conveniently grasped to effect adjustment of the shutter plate in respect to the opening 42.

The air entering the heater drum passes upwardly between the baffle 45 and the heater drum and is heated by the heating element 63 before being permitted to pass from the heater drum to the opening 43 into the space beneath the lower end portion of the conical member 49. The currents of heated air then pass downwardly and outwardly and upon striking the skirt 52 are deflected downwardly and outwardly through the space of slight area between the lower edge of the skirt and the floor, thus making certain that the general direction of the flow of air beneath the hover plate from the heater drum will be outward only. The thermostat 59 will act to open the switch at 56, 57 when a desirable and predetermined temperature has been exceeded.

It will be observed that where air is admitted through floor openings in certain of the hereinbefore described embodiments of an invention, coal gas or gases of combustion are prevented from reaching the chicks under the hover plates and a constant supply of fresh air is assured. It also will be observed that in all forms of the device, the temperature gradient will show a gradual and regular increase from the outer edge of the hover plate to the central source of heat, thus increasing the area of correct temperature for chicks, commonly termed the "chick circle area."

Obviously, our invention is susceptible of embodiment in forms other than those illustrated in the accompanying drawings and we therefore consider as our own all such modifications and adaptations of the forms of the device herein described as fairly fall within the scope of the appended claims.

We claim:

1. A brooder comprising a frusto-conical heater drum disposed in inverted position, a cover plate for said heater drum, said cover plate extending at its marginal edge beyond said heater drum, a frusto-conical hover plate surrounding said heater drum and attached to the extending marginal portion of said cover plate, said cover plate having a central opening and said heater drum having an outlet adjacent to its lower end, a heating element disposed in said heater drum, and means disposed above said cover plate for forcing air through said central opening of the cover plate into and through said heater drum.

2. A brooder comprising a frusto-conical heater drum disposed in inverted position, a cover plate for said heater drum, said cover plate extending at its marginal edge beyond said heater drum, a frusto-conical hover plate surrounding said heater drum and attached to the extending marginal portion of said cover plate, said cover plate having a central opening and said heater drum having an outlet adjacent to its lower end, a hollow baffle supported within said heater drum in spaced relation to said cover plate and to the wall of said heater drum, an electric heating element disposed between said baffle member and said heater drum, a switch for controlling the flow of current to said electric heating element, and a thermostatically controlled means for opening said switch when a predetermined temperature has been reached, and means for forcing air through the central opening of said cover plate into and through said drum, said thermostatically controlled means being adjustable so that the temperature at which the switch will be opened may be varied.

3. A brooder comprising a frusto-conical heater drum disposed in inverted position, a cover plate for said heater drum, said cover plate extending at its marginal edge beyond said heater drum, a frusto-conical hover plate surrounding said heater drum and attached to the extending marginal portion of said cover plate, said cover plate having a central opening and said heater drum having an outlet adjacent to its lower end, a hollow baffle supported within said heater drum in spaced relation to said cover plate and to the wall of said heater drum, an electric heating element disposed between said baffle member and said heater drum, a switch for controlling the flow of current to said electric heating element, and a thermostatically controlled means for opening said switch when a predetermined temperature has been reached, a fan housing supported upon said cover plate and having an inlet, and a fan within said housing operable to draw air through said inlet into the housing and force air from the housing through the central opening of the cover plate into said heater drum.

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