May 14, 1940. H. S. SMITH ET AL 2,200,901

BROODER

Filed May 28, 1938

Fig. 1.

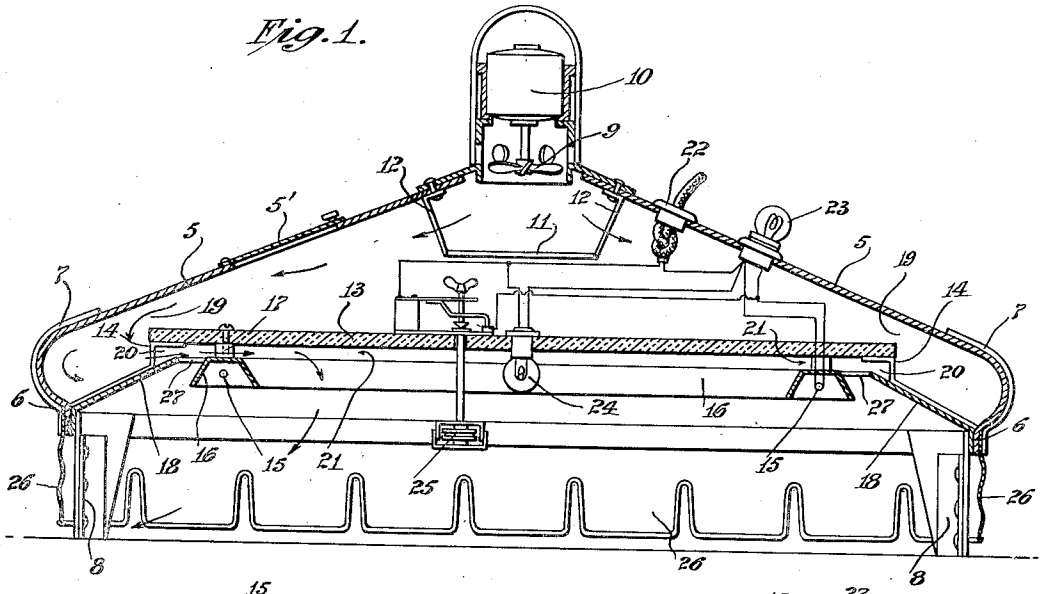
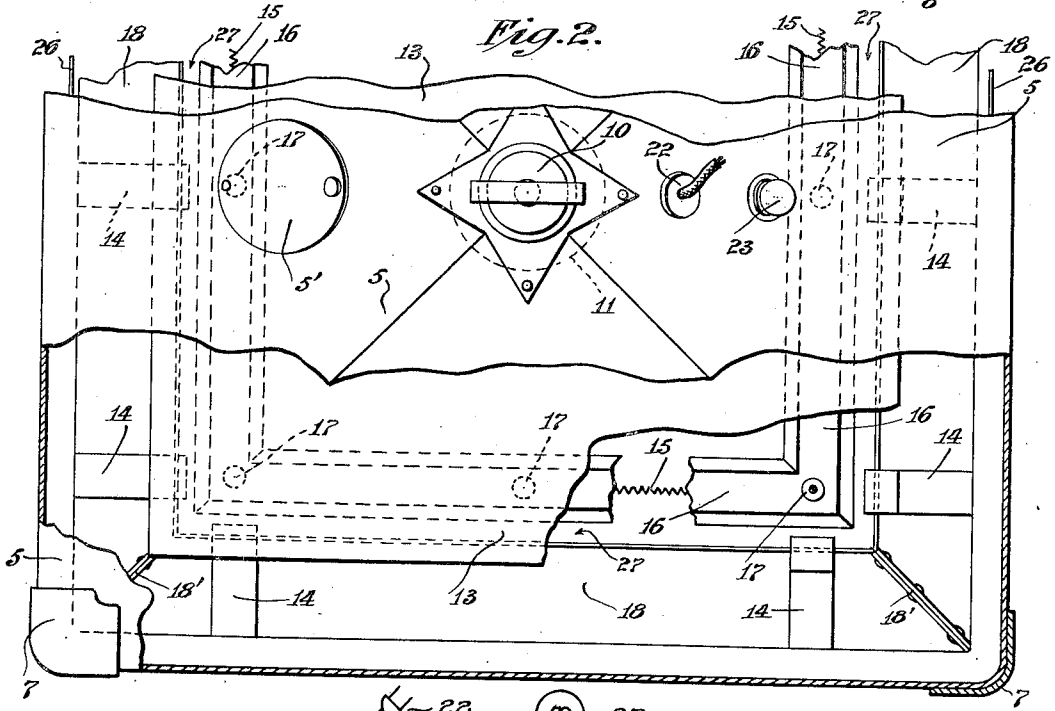


Fig. 2.



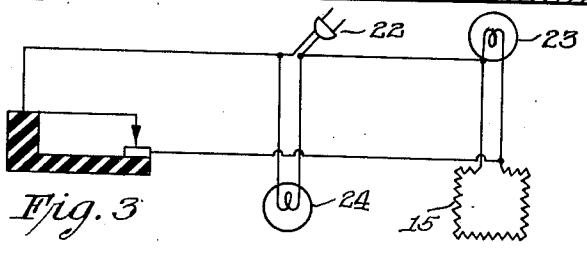


Fig. 3

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BROODER

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Application May 28, 1938, Serial No. 210,552

3 Claims. (Cl. 119—33)

Our invention relates to what are commonly termed "brooders" especially intended for small birds or chicks.

The main object is to provide a sanitary and healthy brooder which can be made at low cost and which is durable and reliable.

A special object is to provide such a brooder in which the entire brooding space is uniformly heated.

A further object is to provide a brooder that is adequately ventilated.

A still further object is to prevent dangerous drafts.

Yet another object is to prevent loss of heat by radiation.

Another object is to provide such a brooder that is easily cleaned, inspected and suspended.

Still another object is to provide a brooder in which the temperature is accurately and automatically controlled.

A further object is to eliminate smoke, soot, oil and gas fumes, etc., from the brooding space.

Another object is to eliminate danger of fire.

In the drawing, Figure 1 is a vertical sectional view of one form of our invention, part of the section being on the central vertical plane of Fig. 2.

Figure 2 is a plan view and partial section of a part of the improved device, portions being broken away to show interior parts.

Fig. 3 is a conventional circuit diagram for such an apparatus.

The main part of the brooder is in the form of a housing with a sloping sheet metal roof 5 terminating in side flanges 6. The corners of the four sides are connected by strong corner pieces 7 and supported by legs 8.

At the top is a housing enclosing a circulating fan 9 supported by a frame and electric motor 10 arranged to force air into the housing through inlets in the housing above the fan. A deflector plate 11 is supported by straps 12 just beneath the fan so as to distribute the air around the housing.

Beneath the deflector is arranged a ceiling plate 13 preferably formed of heat insulating material such as Celotex vapor seal or the like supported by struts 14 which are connected to the flanges 6.

The heating of the air beneath the ceiling is effected by a resistance wire 15 supported beneath a deflector member 16. This wire preferably extends around the four sides of the housing. The deflector troughs are supported at intervals by hangers 17 depending from the ceiling. Baffle plates 18 are supported by the flanges 6 at each side and extend inwardly to a point slightly beneath and beyond the edges of the ceiling plate 13, the adjacent plates being connected at the corners 18'.

The parts are so arranged that there are air passages 19 between the edges of the ceiling plate and the adjacent inner wall of the roof, and passages 20 between the baffle plates 18 and the under side of the edges of the ceiling. There are also passages 21 above the deflectors 16 and between the hangers 17.

Electric current is supplied through a tap 22 secured to the roof. An indicator light 23 is preferably supplied so as to indicate when the heater is on. An attraction light 24 is also preferably supplied inside supported by the ceiling. A door 5' may be provided for access to the inside of the housing.

The automatic control of the temperature in the brooder space is effected in the usual manner by a suitable thermostatic device 25 and conventional electric circuit connections to the resistance heater wire 15 carried by the ceiling. This ceiling is readily demountable so that the socket for the lamp 24 and the automatic control may be assembled on the ceiling with the heater and inserted and removed as a unit.

A cloth curtain 26 is supported around the edges of the housing in the usual manner.

The outside air is drawn into the housing by the fan 9 and forced to move through the passages 19 to the outer edges of the housing and thence through the passages 20 and 21 above the deflectors 16.

The moving air is heated primarily when it goes through passage 21, although some heat may be picked up in the upper chamber above the ceiling and in passing around the edges of the ceiling. When the air currents from opposite sides of the brooder meet in the center under the ceiling, each current deflects the opposing current downwardly against the floor so that there is an outward flow of heated air from the center of the brooder along the floor to the curtains, where much of it escapes.

An open space, 27, is provided between the edge of baffle 18 and the adjacent wall of deflector 16 to produce a recirculation of a small part of the air in the brooder. When air is forced from passage 20 to passage 21, the current will pick up some of the air in space 27, thus inducing this recirculation. This limited recirculation conserves heating energy without sacrificing an ample fresh air supply.

The movement of air around the edges of ceiling 13 at the passages 19 and 20 will keep the

edges of the ceiling and the baffles 18 cool. This also conserves heat.

It should be noted that there is a direct radiation of heat below heater 15 and deflector 16 in addition to the spreading of heated air by the moving currents. This direct radiation prevents the edges of the brooding space from becoming too cold from outside drafts.

The deflector 16 therefore serves several useful purposes. First, it acts as a primary contact surface for heating incoming air. Second, it acts as a means for directing the flow of air toward the center of the brooding space. Third, it acts as a reflector for radiated heat from the wires. Fourth, it is one of the surfaces which guide some of the previously heated air to produce the limited recirculation. Incidentally, the deflector also guards the heating wire to some extent from accidental damage.

The construction is such that there is a maximum degree of uniformity of temperature and a freedom from drafts. Also the double roof and ceiling construction, arrangement of heating elements and the positive control of the circulation not only prevent loss of heat by radiation but use all of the heat in the most economical manner. Furthermore, it provides for maximum chick comfort.

We claim:

1. A brooder having a slanting roof with an air inlet, a flat ceiling positioned between the top and lower edge of said roof providing spaces above and below said ceiling, said ceiling being supported with its periphery spaced from the sides of the roof and providing a passage therebetween, a fan supported by the roof and positioned in said air inlet for circulating the incoming air, a deflector plate extending around the lower edge of said roof and extending from the lower edge of said roof upwardly toward and inwardly of but spaced from the periphery of the ceiling providing a passage between said plate and ceiling in communication with the space below the ceiling, a heating element positioned adjacent said latter passage and supported on but spaced from the under surface of said ceiling and providing a passage between said heating element and ceiling, and a deflector element surmounting said heating element beneath the latter passage.

2. In a brooder, a housing having a ceiling supported therein, air inlets at the edges of the ceiling, means for directing currents of air outwardly toward the inlets and then inwardly from the inlets toward the center of the housing, heating means including a deflector adjacent to but spaced from the ceiling and spaced from the inlets, the spacing between the inlet and the deflector providing recirculation of some of the air below the deflector.

3. A brooder having a housing with a ceiling supported therein and a chamber above the ceiling, baffle plates secured at their outer edges to the edges of the housing and extending beneath the edges of the ceiling and leaving air inlets between the inner edges of the baffle plates and the ceiling, heating means suspended from the ceiling beneath the level of said air inlets, and means for forcing air into said chamber above said ceiling and between said baffle plates and said ceiling and around the heating means below the ceiling.

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