July 12, 1938. K. W. DU BOIS 2,123,671

BROODER

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Fig. 1.

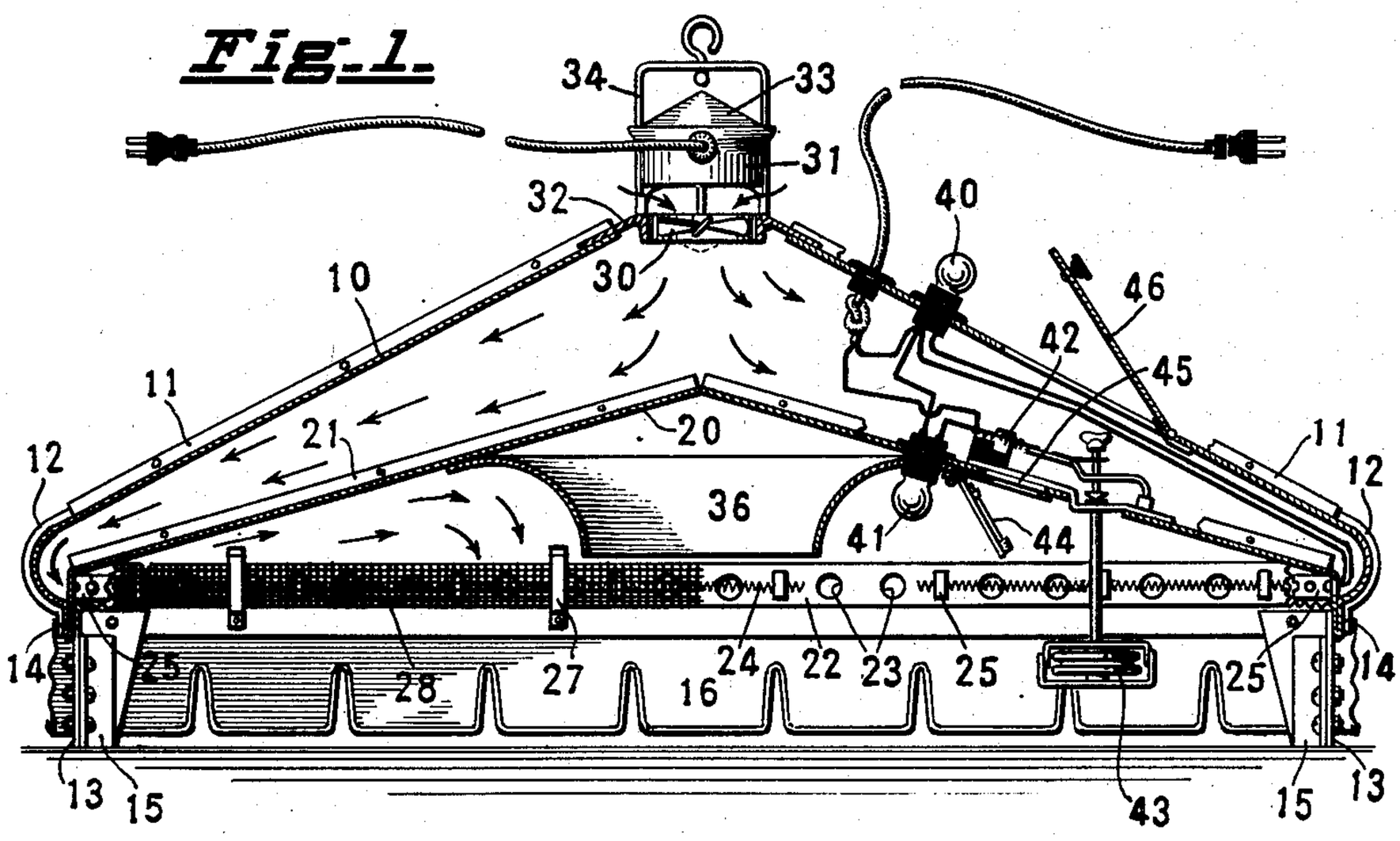

Fig. 2.

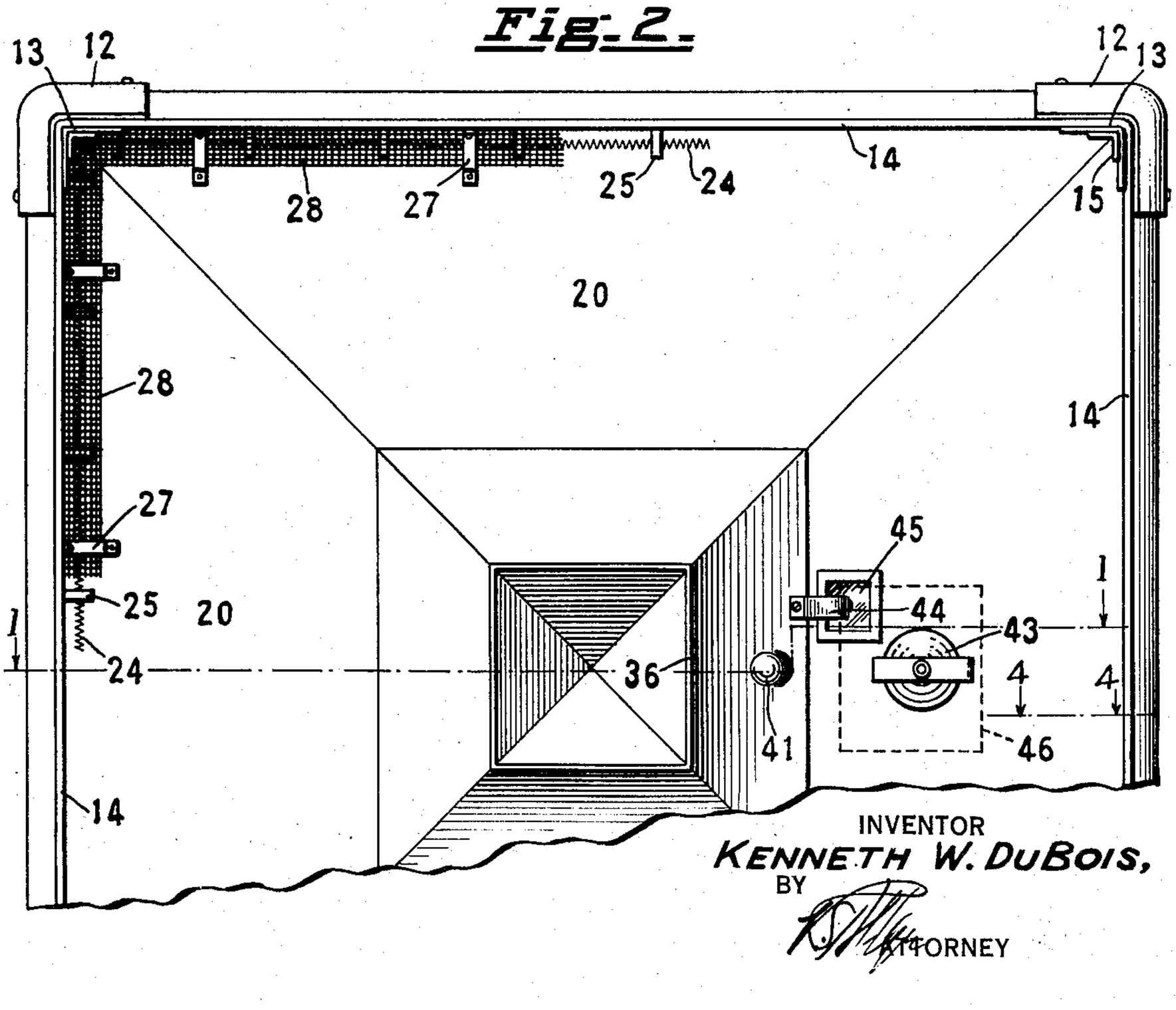

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Fig. 3.

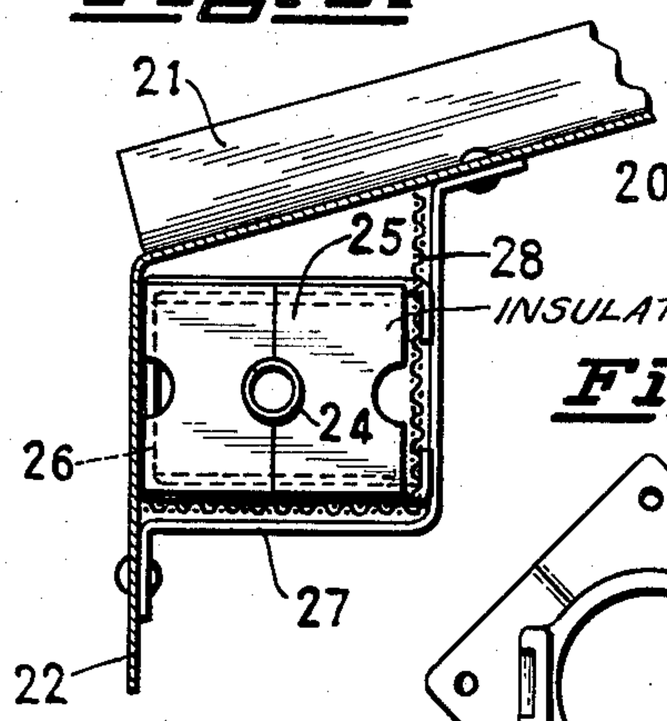


Fig. 4.

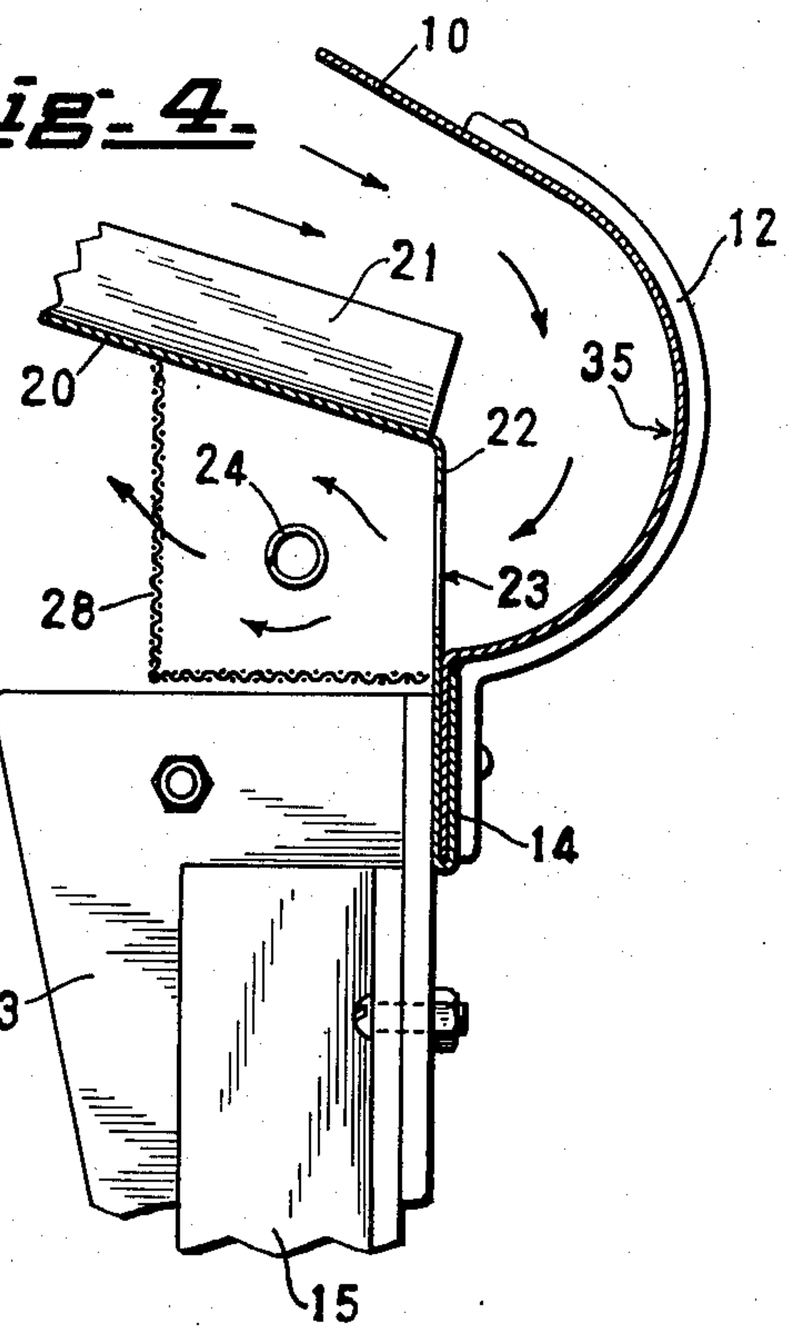


Fig. 6.

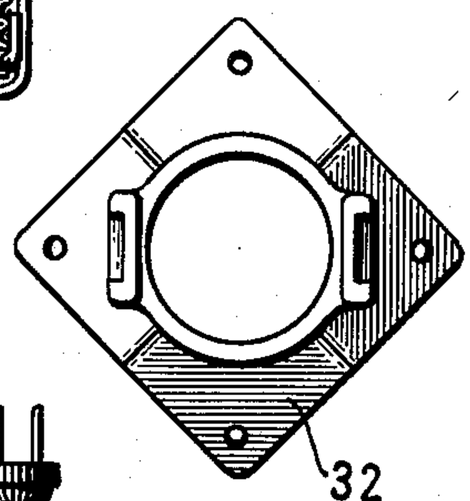


Fig. 7.

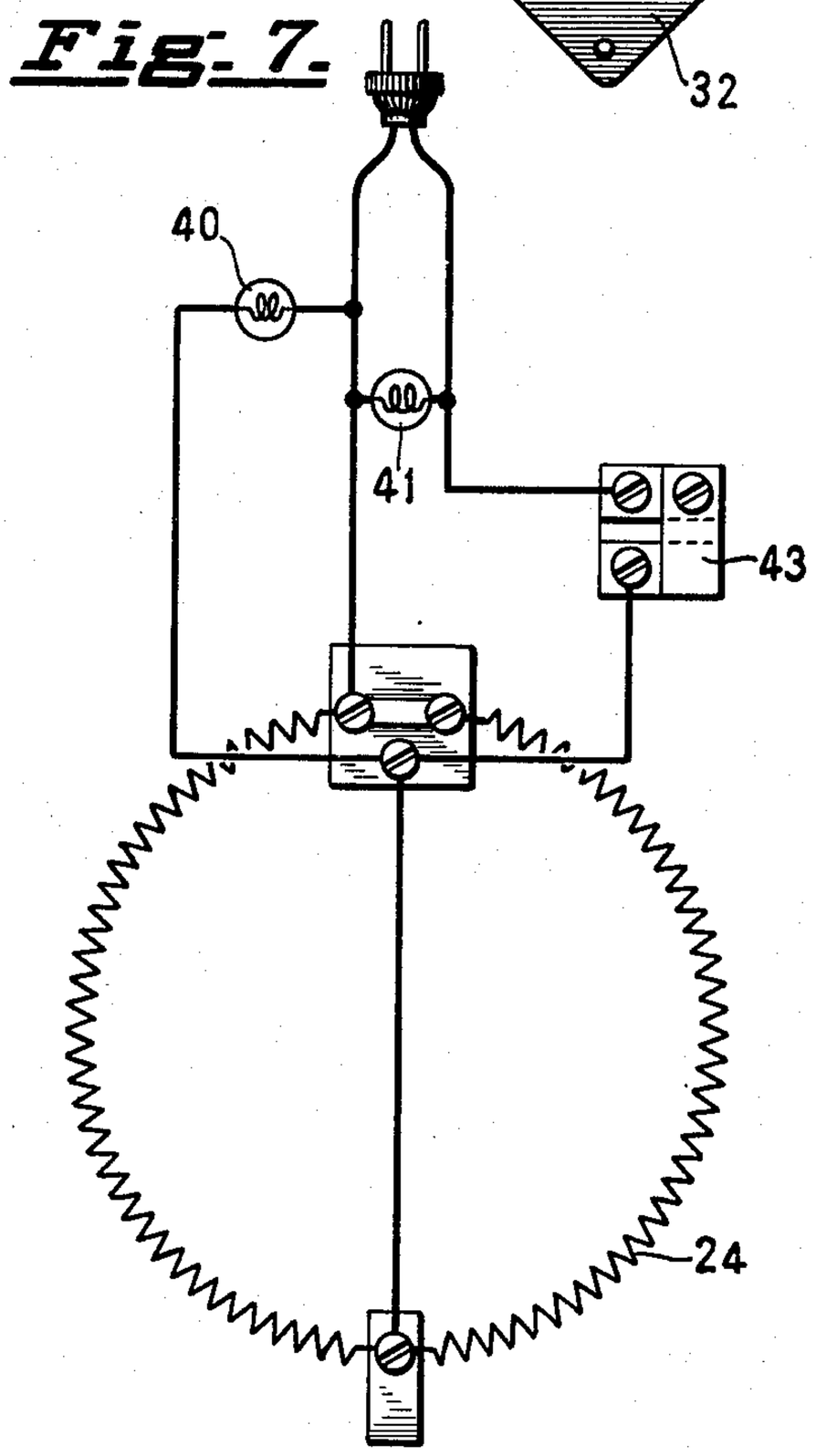
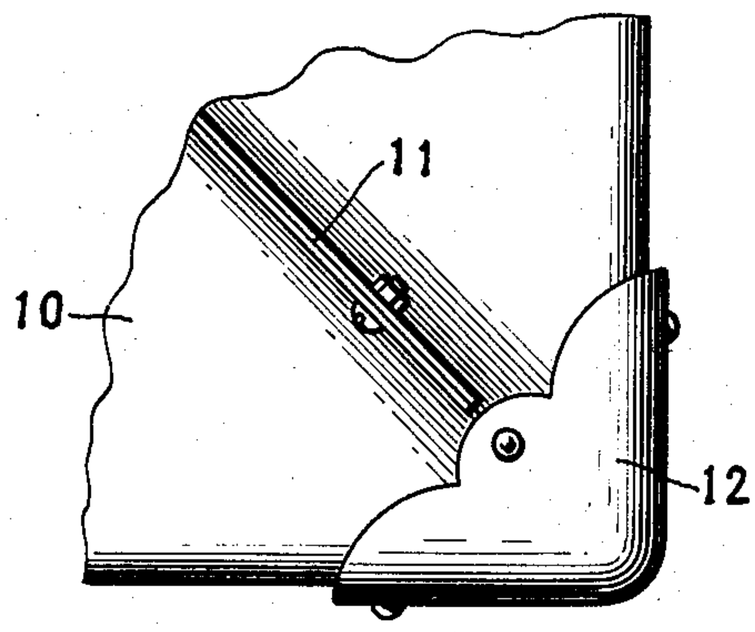


Fig. 5.



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Patented July 12, 1938 2,123,671

UNITED STATES PATENT OFFICE

2,123,671

BROODER

Kenneth W. Du Bois, Plainville, Conn., assignor to The Trumbull Electric Manufacturing Company, Plainville, Conn., a corporation of Connecticut

Application September 17, 1936, Serial No. 101,219

6 Claims. (Cl. 119—33)

My invention relates particularly to brooders which are heated electrically.

The main object is to provide a brooder which will promote healthy growth of chicks. Extended experiments have proved that the most satisfactory results are attained by forcing air into the brooder around the edge but above the ground level and allowing it to escape around the edge at or near the ground. This provides warm fresh air which flows downwardly over the backs of the chicks and also between them so as to warm the floor or ground and the litter.

Another object is to provide a brooder in which the chicks will not be injured.

Another object is to provide a strong, practical commercial type of structure which can be made and sold for a reasonable price.

Another object is to provide a structure which is economical to operate.

Another object is to provide a structure which can be readily inspected and regulated.

In carrying out my invention, I provide a hover which has an outer wall or casing and an inner wall which forms the ceiling of the brooding chamber. These walls are united around their peripheries and provided with passages so that air drawn in at the center of the top of the outer casing is forced into the outer edge of the inner wall and thence descends in the brooding chamber and is forced out through and beneath the curtain or skirt which depends from the outer edge of the casing.

An electric resistance heater is arranged around the edge of the ceiling so that the incoming air is heated as it enters the brooding chamber. The air is forced through the brooder in some suitable manner. For convenience in installation and operation I prefer to use an electrically driven fan which is supported at the top of the center of the casing.

The temperature is controlled or regulated by a thermostat located in the brooder chamber and the temperature may be read from a thermometer visible through a window in the ceiling. The thermostat may be adjusted by access through a door in the outer casing.

Details of other improvements will be understood from the accompanying drawings and the following description.

Fig. 1 is a vertical sectional view, partially diagrammatic, of a brooder involving one form of my invention with a fan for forcing air into the top and showing by the arrows the direction of air circulation the section being taken largely on the plane of the line 1—1 of Fig. 2.

Fig. 2 is a view of a part of the brooder of Fig. 1 looking upwardly.

Fig. 3 is a fragmentary sectional view on a larger scale showing the support for the heater unit and guard.

Fig. 4 is a fragmentary sectional view on the same scale as Fig. 3 showing a corner of the brooder with arrows indicating the circulation of air the section being taken on the plane of the line 4—4 of Fig. 2.

Fig. 5 is a plan view of a fragment of one corner of the brooder.

Fig. 6 is a plan view on a small scale of a device used for connecting the four sides of the outer wall of the hover and supporting the fan and its motor.

Fig. 7 is a diagrammatic view of the electrical circuits.

The outer casing is preferably pyramidal or conical and may have a number of inclined sections 10 (for instance, four as shown) united by outer seams 11. The corners are formed and protected by castings 12 which are mounted on angle iron legs 13 to which the flanges 14 of the casing sections may also be secured. These legs are preferably provided with adjustable extensions 15 by means of which the height of the brooder may be varied. A cloth skirt or curtain 16 depends from the flange of the casing.

The inner wall or ceiling 20 may be of any suitable form but is preferably also pyramidal or conical and made up of sections united by joints or seams 21. The peripheral flange 22 is interlocked with the flange 14 of the outer casing. Openings 23 are provided in the outer edge of the ceiling so that air from the inside of the outer casing can pass into the brooder chamber inside of the curtain 16.

The resistance wire 24 constitutes the heating means and is supported by porcelain or similar blocks 25 which are secured by clips 26 to the inside of a wire meshwork guard 28. This guard is secured to the ceiling member 20 by a number of straps 27.

In the form shown herein the circulation of air is produced by means of a fan 30, driven by an electric motor in the casing 31. This casing is supported by a fixture 32 which also serves to connect the upper edges of the casing sections 10—10. The motor casing may have a cover 33 and preferably has a strap 34 secured to it by means of which the entire brooder may be lifted. It should be understood, however, that broadly considered the invention is not limited to these details.

The outer edge of the casing is preferably curved so as to provide a convenient channel 35 to deflect the air inwardly through the openings 23 and past the heater wire 24 into the brooder chamber. The ceiling of the brooder chamber is preferably inclined and preferably provided with curved deflector members 36 so that the warm air will be turned downwardly toward the center of the casing. The continued inrush of fresh air forces the used air along the floor and out from beneath the edges of the curtain. This method of air circulation tends to eliminate any cold floor or ground drafts which would normally tend to enter through the cloth skirt or curtain since the exhausted heated air is moving out beneath the skirt. This method of circulation also provides the chicks with the proper amount of oxygen, carrying the heat from the edge of the brooder toward the center and then down on the backs of the chicks. A large amount of this heated air passes between the chicks into the litter onto the floor, thus warming the litter.

It will also be noted that when the inner ceiling is formed of sheet metal, which is preferred, the warm air in the brooder chamber raises the temperature of the ceiling and thus serves to preheat the air in the passage above the ceiling and beneath the wall of the outer casing 10.

This construction greatly reduces thermal losses and makes it unnecessary to employ insulating material to conserve the heat. It should be understood, however, that the outer casing might be insulated if desired. Although the pyramidal shape of the ceiling and the deflector members is preferred, it should be understood that an ordinary flat ceiling may be employed in some cases.

Preferably the brooder is provided with an indicator or pilot light 40 on the outer casing and also with a small attraction light 41 carried by the inner hover or ceiling.

The control switch 42 may be of any suitable type actuated by an adjustable thermostatic device 43, carried by the ceiling 20. A thermometer 44 is also preferably provided and adjustable to the desired position beneath the ceiling in the brooder chamber. A window 45 in the ceiling is preferably provided so that the thermometer may be read when the door 46 in the outer casing is opened.

Although the square type casing illustrated provides a maximum sized brooder chamber for a given floor space, it should be understood that the invention is not limited to this shape.

The construction shown and described has been found to be an efficient solution of the problems involved in electrical heating of brooders. The forced draft circulation of air, as shown and described, is effective and healthy for the chicks. The rigid mechanical construction insures long life to the apparatus. The mechanical and electrical arrangement insures a great efficiency and a small electric power requirement. The inner and outer walls of pyramidal form united at their edges insure great strength for a given thickness of metal. The independently adjustable legs at the corners permit leveling the brooder on an irregular floor. The direction of circulation of the air insures a uniform temperature within the brooder chamber. As the outside air is drawn in at the apex of the casing at the maximum height above the ground, I avoid picking up dirt and dust from the ground and thus provide a substantial purity of air.

I claim:

1. A brooder of square outline having an outer casing and an inner ceiling with interlocking flanges and reinforcing corner pieces and having a return channel in the edge of the casing, the flange of the ceiling having air openings directed toward the center of the brooder, a heater wire mounted at the edge of the ceiling in line with said channel and said openings, and a motor driven fan for forcing air circulation between the casing and the ceiling and into the center of the brooder through said openings.

2. A brooder having an outer casing and an inner sheet metal ceiling for the brooder chamber, means for forcing air between the casing and the ceiling and into the chamber at its outer edge and toward the center of the brooder, means for heating the air as it passes into the chamber, the ceiling serving to preheat the air between the casing and the ceiling, and means for deflecting the warmed air toward the center of the chamber and allowing the used air to escape from beneath the outer edge of the chamber.

3. A brooder of square outline having an outer casing and an inner ceiling with interlocking flanges and reinforcing corner pieces and having a return channel in the edge of the casing, the flange of the ceiling having air openings leading to a space beneath the ceiling, an electric heater mounted at the edge of the ceiling in line with said channel and said openings, and means for forcing air circulation between the casing and the ceiling and into the center of the brooder through said openings.

4. A brooder casing having a ceiling with a depending wall having openings, resistance heating wires extending around the inside of the casing adjacent the openings in the wall, and means for forcing air inwardly through said openings and past said heating wires toward the center of the casing and deflecting the heated air downwardly near the center of the casing so that it finally passes outwardly beneath the incoming air.

5. A brooder having an outer casing member and an inner ceiling member spaced apart therefrom, means for securing the outer edges of said members together, means for forcing air into the space between said members, said inner member having a depending portion with openings through which air passes from the space between the members to the space beneath the inner ceiling member, and electric heating means arranged within the brooder in line with said openings, said ceiling member having an inner surface for deflecting the warmed air downwardly toward the center of the brooder.

6. A brooder having an outer pyramidal casing and an inner pyramidal sheet metal ceiling for the brooder chamber with a space between the casing and the ceiling, means for forcing air into the center of the casing and between the casing and the ceiling and thence into the outer edge of the chamber and inwardly toward the center, and means for heating the air as it passes into the chamber, the ceiling serving to preheat the air between the casing and the ceiling.

KENNETH W. DU BOIS.