July 12, 1938. K. W. DU BOIS 2,123,672

THERMOSTATIC CONTROL

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Fig. 1.

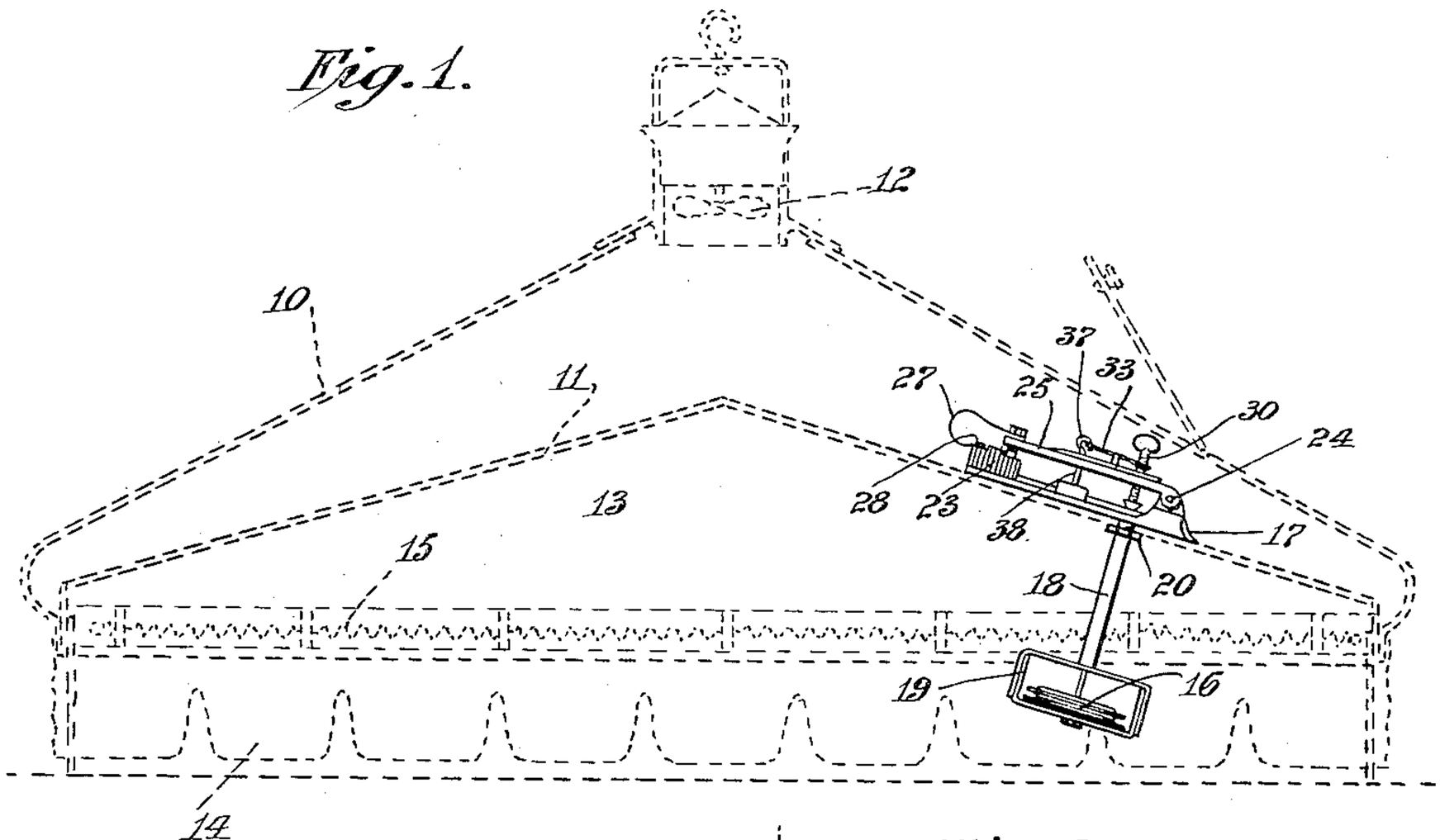

Fig. 2.

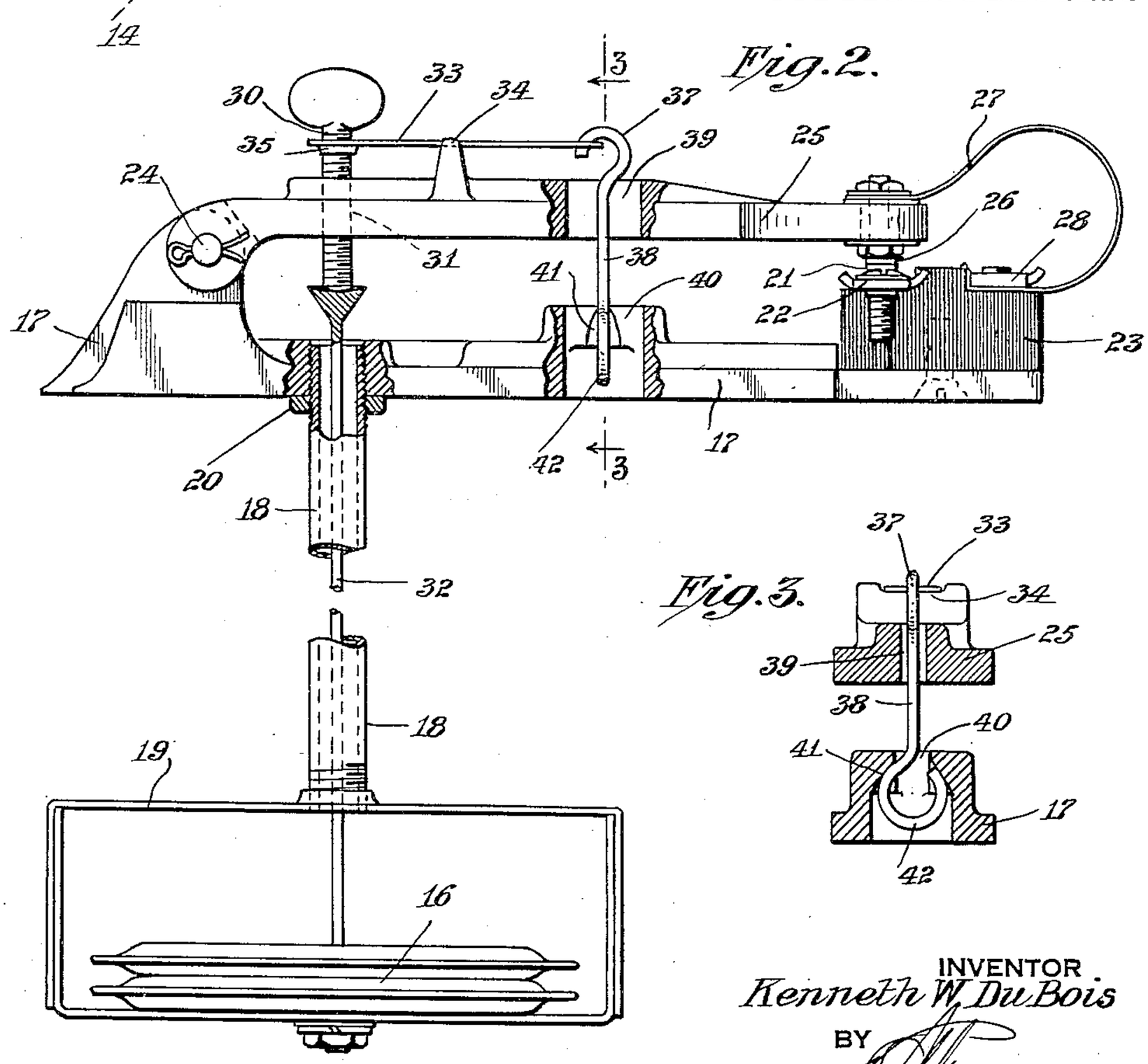

Fig. 3.

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Fig. 4.

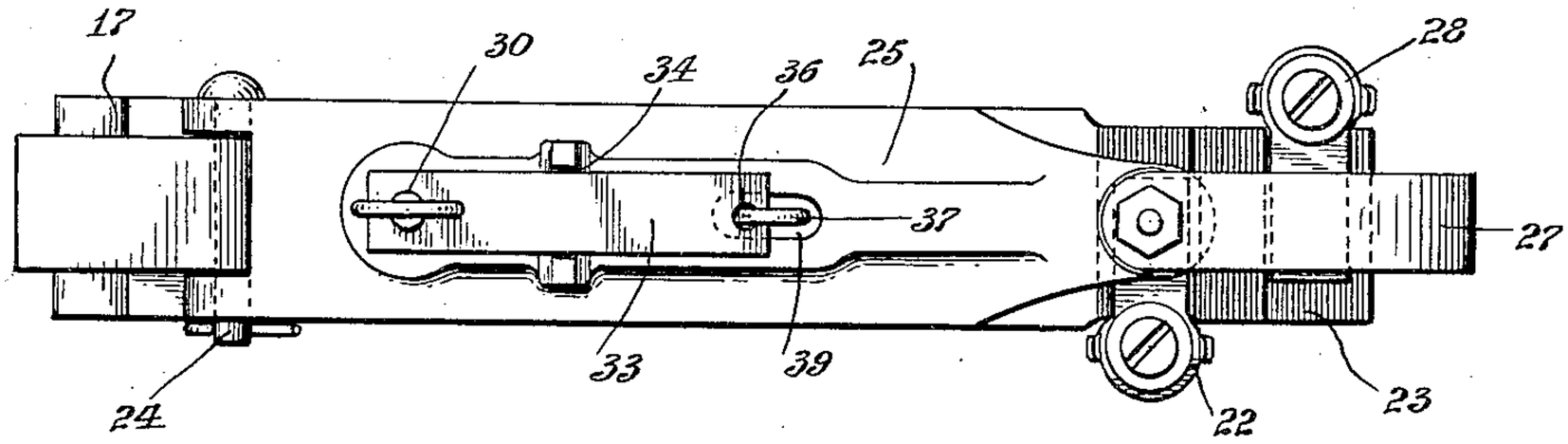
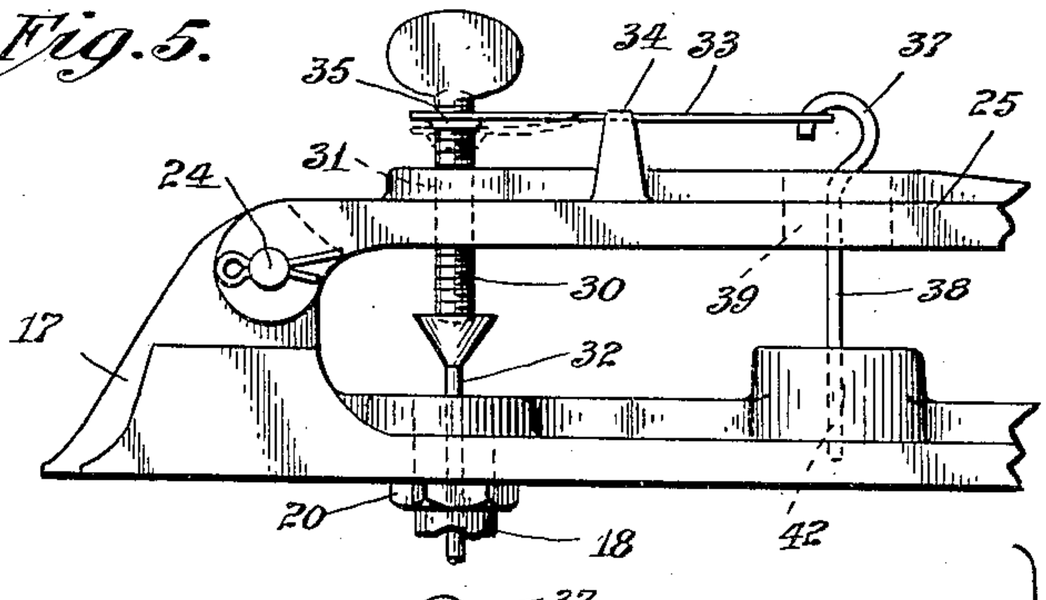


Fig. 5.



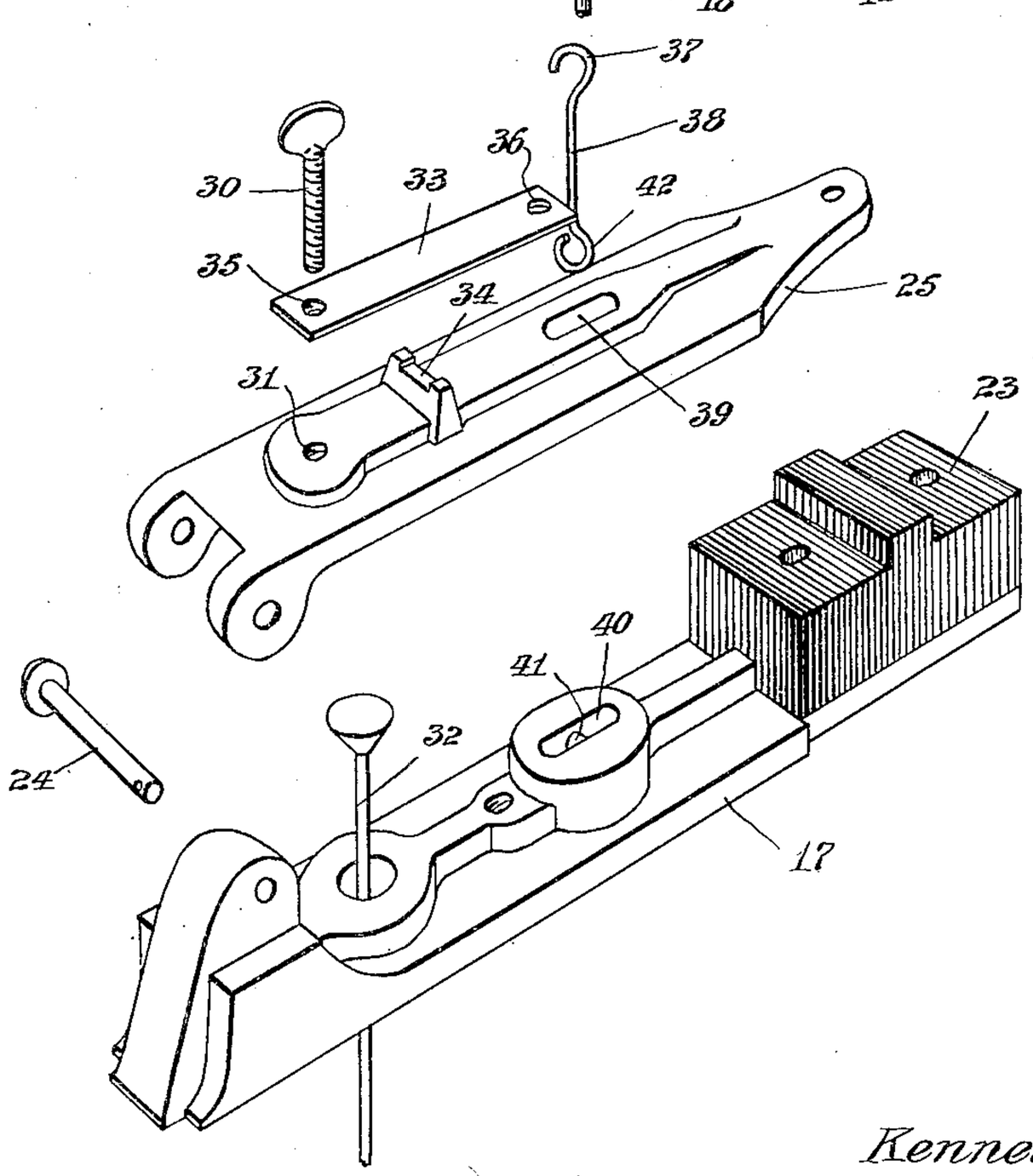


Fig. 6.

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UNITED STATES PATENT OFFICE

2,123,672

THERMOSTATIC CONTROL

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Application April 27, 1937, Serial No. 139,179

5 Claims. (Cl. 200—140)

My invention is particularly intended for use with electrically heated brooders for chickens. To maintain a brooder at the proper temperature it is necessary to open and close the heater circuit frequently. For this purpose an electric switch is provided which is actuated in one direction by a temperature responsive device such as an expansible and contractible bellows and in the other direction by a spring. It is highly desirable that the action of the switch be adjustable so that the temperature of the brooder may be regulated to the desired degree.

One object therefore of my invention is to provide a device which is sensitive and readily adjustable.

Another object is to provide a construction which is rugged and reliable and not likely to get out of adjustment accidentally.

Another object is to provide a device which is simple and of few parts.

The preferred form of the invention includes a stationary part which constitutes the base or support and an arm hinged to the base. These two parts carry the respective contact points of the switch.

A plate-like spring rests on the arm and is connected at one end by a link to the base and at the other end by a screw to the arm.

This screw coacts with the thermo-responsive member and is adjustable in the arm for regulating the action of the switch arm. The switch contacts may be either of the snap action or ordinary slow break.

Fig. 1 shows a side view of the device installed in a brooder which is shown in dotted lines.

Fig. 2 is a side view and partial section of the device approximately full sized.

Fig. 3 is a transverse section on the plane of the line 3—3 of Fig. 2.

Fig. 4 is a plan view of the device without the thermo-responsive device.

Fig. 5 is a side view of a fragment of the device showing the spring dotted in an alternative position.

Fig. 6 is a drop-perspective view of the principal parts of the device.

One suitable form of brooder is shown in a copending application Serial Number 101,219 filed September 17th, 1936, by me.

In this form the main casing 10 of the brooder has an inner ceiling 11 and air is drawn in by a fan 12 at the top and forced between the casing and the ceiling into the chamber 13 beneath the ceiling where the chicks are housed. A skirt or curtain 14 depends from the casing. The air is heated by a suitable protected resistance type heater 15 arranged around the inside of the ceiling. The thermo-responsive bellows 16 of conventional form contains a sensitive fluid which expands and contracts with the rise and fall of the temperature in the chamber where the bellows are located.

The base 17 of the device is supported by the ceiling 11 and in turn supports the bellows through the medium of the tube 18 and the frame 19. The tube is screwed into the base and held by a set nut 20. It extends downward through the ceiling and serves to support the bellows in the proper position in the brooder chamber 13.

The thermostatic switch device may be mounted at an angle as shown or with the tube 18 vertical or in any other suitable position.

The stationary contact 21 of the switch which contacts the heater circuit is carried by the circuit terminal 22 which is mounted on the insulating block 23 which is secured on the end of the base remote from the pivot pin 24. The switch arm 25 is pivoted on pin 24 and carries at its outer end the movable switch contact 26 which is insulated from the arm in any suitable manner and connected by a flexible conducting strip or wire 27 to the circuit terminal 28 mounted on the block 23.

A screw 30 has a threaded engagement in a passage 31 in arm 25 and at its lower end engages the upper end of the rod 32 which extends downward through the tube 18 and presses against the upper surface of the bellows 16. A plate-like spring 33 rests on a sort of knife edge 34 on the upper surface of the arm 25. One end of this spring has a threaded portion 35 for the screw and the other end has an opening 36 for the hook 37 of link 38. The arm 25 has a passage 39 for the link. The base also has a passage 40 for the link and a seat or groove 41 for the foot 42 of the link. This foot and the groove extend transversely of the base so as to in effect provide a knife-edge bearing against which the tension of the spring 33 is exerted. The spring is so set as to exert pressure downwardly on the screw 30 and thus hold the arm down with the switch in the closed circuit position.

When the bellows expands with a rise in temperature it raises the arm 25 and opens the circuit which cuts off current through the heater. When the air in the chamber 13 cools the predetermined amount the bellows contracts and the spring 33 moves the arm 25 so as to close the circuit and start up the heating action again. The

pressure on the bellows can be regulated by adjusting the screw 30 in the arm 25. The spring 33 exerts a constant pressure on the threads of the screw so as to prevent it from turning accidentally. By disconnecting the spring from the hook 37 the spring may be rotated about the screw 30 so as to change its initial position as shown by the dotted lines in Fig. 5.

It will be thus seen that the single spring 33 serves not only to press the arm against the expansion of the bellows but also to prevent the screw from working loose.

I claim:

1. In an electric switch, a base, an arm hinged to the base, a spring supported by the arm, a link connecting one end of the spring to the base, an adjusting screw in the arm connected to the other end of the spring and actuating means coacting with said screw.

2. In a switch, a base, an arm hinged thereto, a pressure screw carried by the arm, a plate-like spring having its central portion supported by the arm, said screw passing through one end of the spring, and a link hinged to the base and to the end of the spring opposite the screw.

3. A thermostatic switch including a base, a stationary switch member thereon, an arm hinged at one end to said base and movable at its other end toward and from the base, a switch member carried by the movable end of said arm, a bellows carried by the base, a movable rod connected to the bellows, a screw fast to the arm and operatively connected to the rod to move the arm upward away from the base and a pivotally seated spring plate having one end connected to the base and its other end connected to the screw for biasing the arm toward the base.

4. A thermostatic switch including a base, a stationary switch member thereon, an arm hinged at one end to said base and movable at its other end toward and from the base, a switch member carried by the movable end of said arm, a bellows carried by the base, a movable rod connected to the bellows, a screw fast to the arm and operatively connected to the rod to move the arm upward away from the base and a spring plate pivotally mounted at its center on the arm and having one end detachably connected to the base and its other end screw threaded to the screw for adjustment up and down along said screw.

5. A thermostatic switch including a base, a stationary switch member thereon, an arm hinged at one end to said base and movable at its other end toward and from the base, a switch member carried by the movable end of said arm, means for moving said arm and switch member away from the base, said means including a bellows on the base, a movable rod operatively connected with the bellows and a screw member supported by and extending through the arm and operatively connected to the movable rod, and means for normally biasing said arm toward the base, said means including a link member supported by the base and extending loosely through the arm, a spring plate member having one end connected to the link and its other end connected to the screw and a pivotal support for said plate on the arm.

KENNETH W. DU BOIS.