Dec. 6, 1932. O. V. ROOKSTOOL 1,890,236

INCUBATOR

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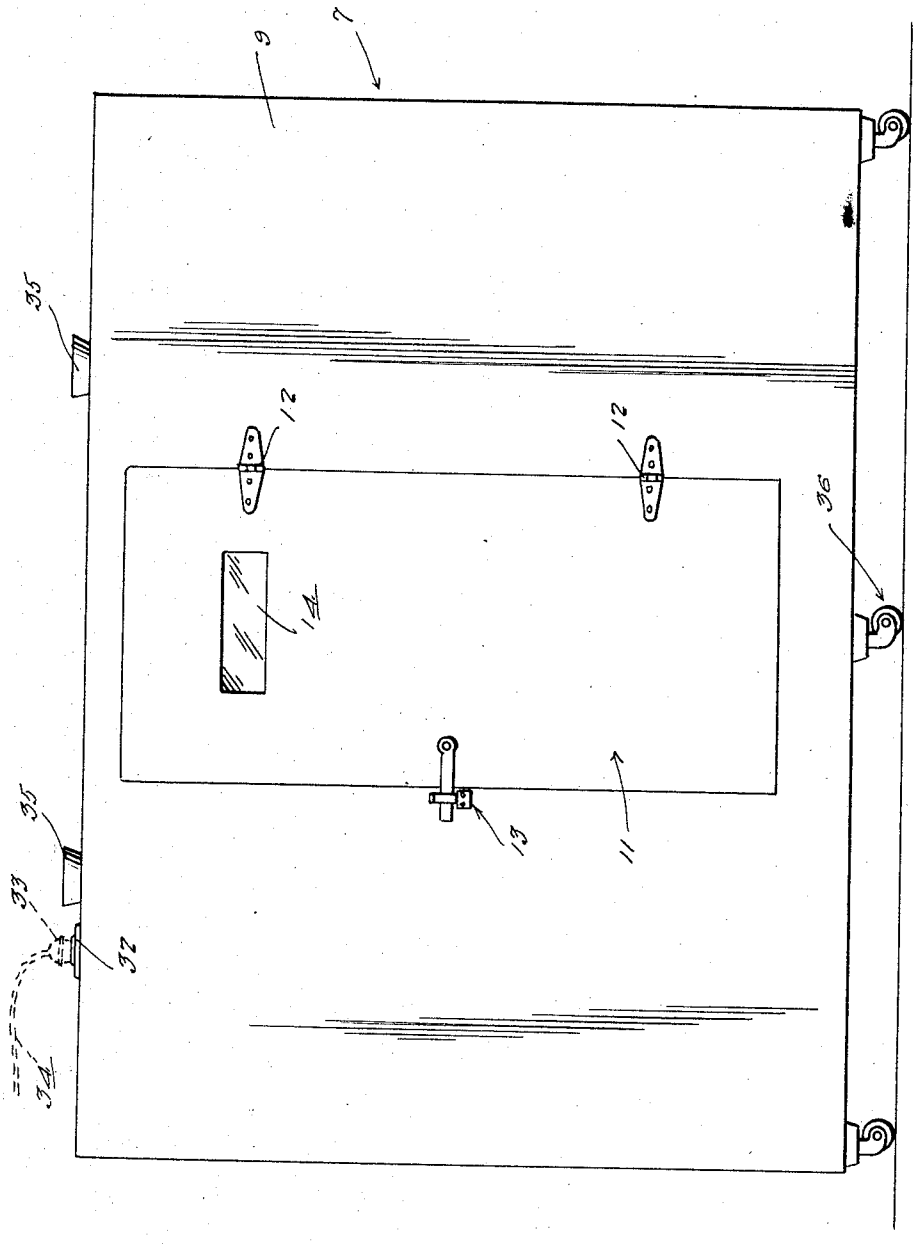


Fig. 1.

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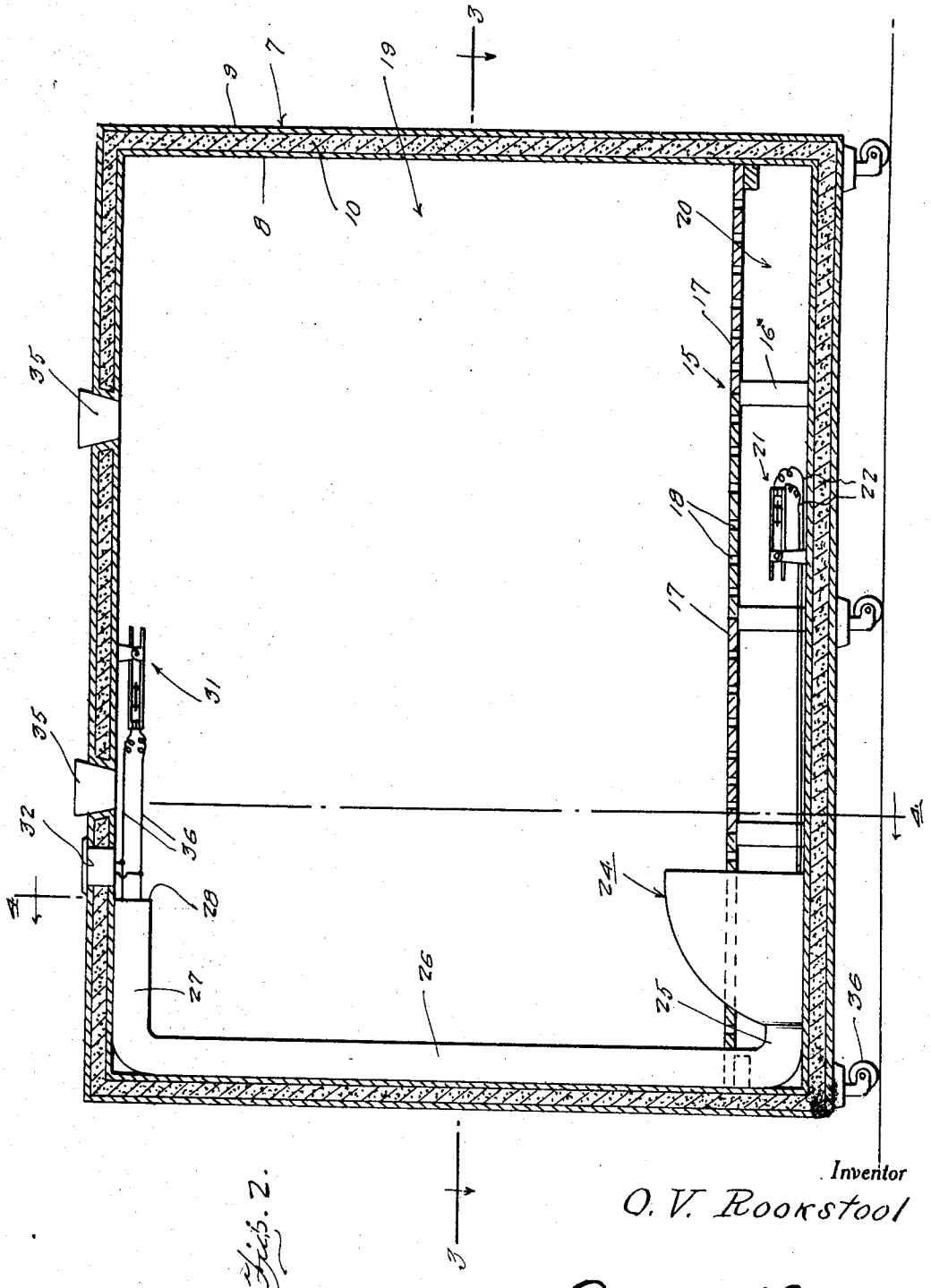


Fig. 2.

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Fig. 3.

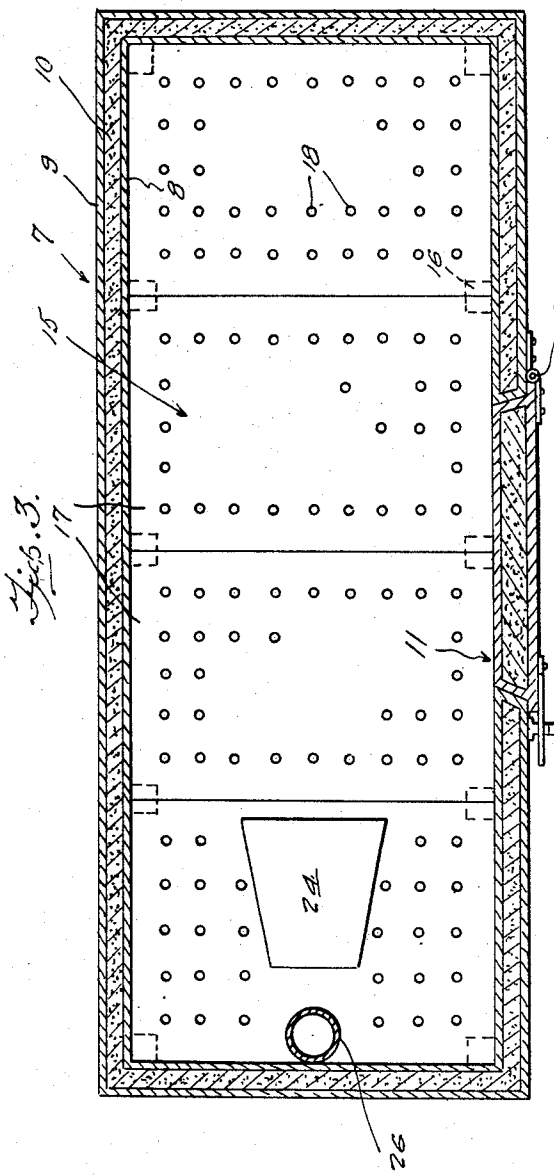
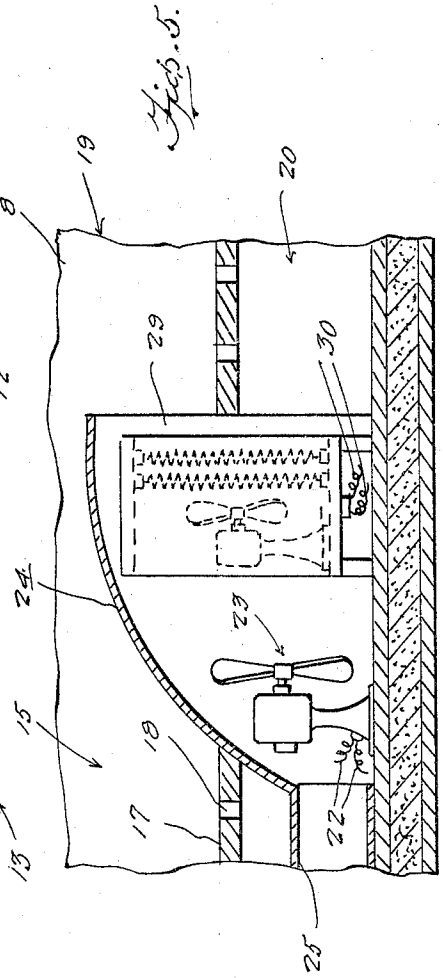


Fig. 5.



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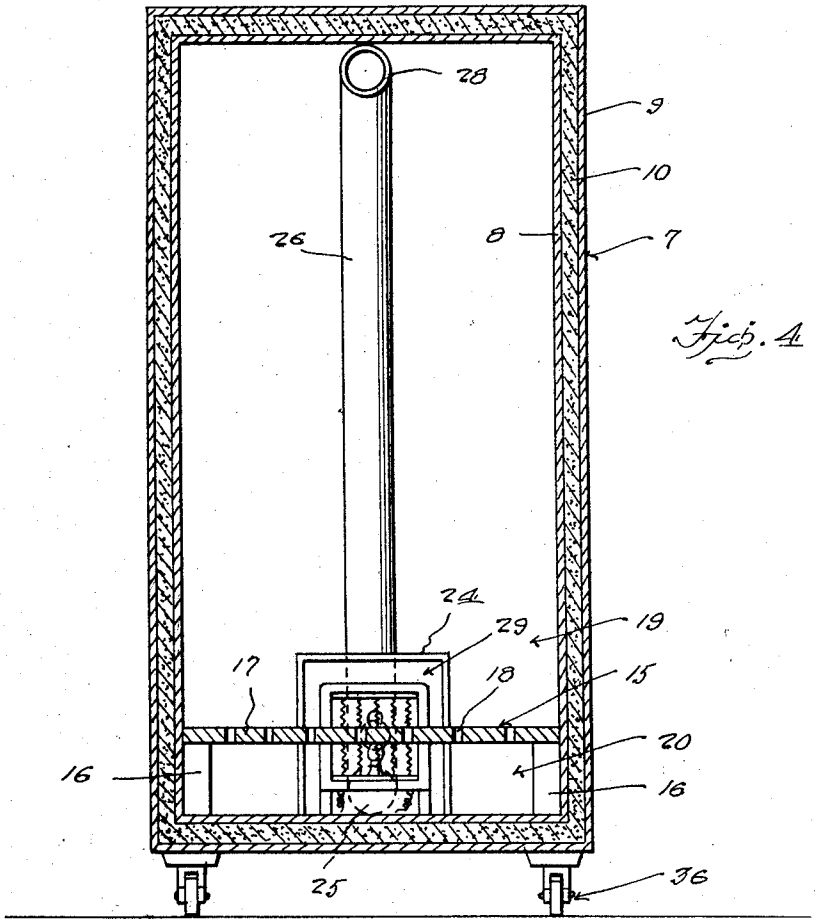


Fig. 4.

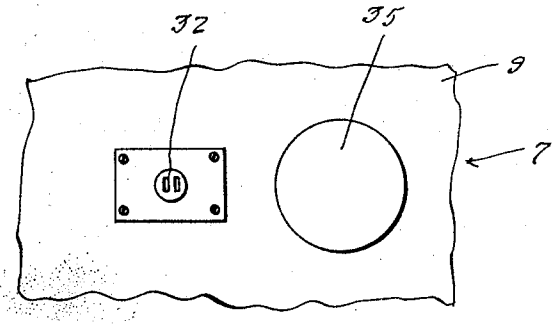


Fig. 6.

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Patented Dec. 6, 1932 1,890,236

UNITED STATES PATENT OFFICE

OMER V. ROOKSTOOL, OF McCRACKEN, KANSAS

INCUBATOR

Application filed January 18, 1932. Serial No. 587,399.

This invention relates to an improved incubator designed for hatching eggs and believed to be a novel contribution to the art in that it is characterized by the incorporation therein of novel electrical features destined to operate in an efficiently co-ordinated manner to better fulfill the requirements of a structure of this class.

My primary aim is to generally improve upon prior art and commercially marketed incubators by providing a novel structural organization of parts especially selected and arranged to promote simplicity and efficiency.

One feature of the invention is predicated upon the unification and co-operation of an automatically controlled fan-type electric heater operating in conjunction with an automatic thermostatically controlled air circulating fan whereby to maintain uniform temperature throughout the internal area of the cabinet and to thereby promote better conditions and at the same time conserve heat and current.

Another feature of the invention is founded upon a satisfactory arrangement of parts designed to expeditiously cool the eggs when required by a simple process of introduction of atmospheric air to displace the heated air.

A further feature of construction is founded on the construction of the insulated laminated wall of the cabinet, the window equipped door and the simplified allocation of internal parts designed for efficiency in heating and cleaning.

Other equally pertinent features and advantages will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a front elevation observing the structure from the exterior thereof.

Figure 2 is a central vertical sectional view with parts in elevation.

Figure 3 is a horizontal section on the line 3—3 of Figure 2.

Figure 4 is a transverse vertical section taken approximately on the plane of the line 4—4 of Figure 2.

Figure 5 is an exaggerated detail of the electric heater and fan assembly.

Figure 6 is a fragmentary plan view of a part of the top of the cabinet.

The cabinet is denoted generally by the numeral 7 and is here shown as of approximate rectangular configuration, although the shape and proportions are immaterial. As seen for example in Figure 4, the cabinet comprises a casing constructed of inner and outer walls 8 and 9 with an insulating filler 10 therebetween to provide the requisite heat maintenance properties. As seen in Figure 1, the numeral 11 designates a suitably insulated door suspended from appropriate hinges 12 provided with suitable latch means 13 and with a window 14.

The window is located to permit frequent inspection to be made without opening the door. The numeral 15 denotes an elevated floor supported on appropriate blocks 16 and composed of a plurality of removable plate sections 17 formed with a multiplicity of apertures 18 for air circulation purposes. This floor is located near the main bottom and divides the interior of the cabinet into upper and lower compartments 19 and 20 respectively.

Mounted in the lower compartment as seen in Figure 2, is a suitable single wafer heat controlled thermostat 21 which is automatically operable on a predetermined low temperature existing in the lower portion of the cabinet. This thermostat is provided with current supply wires 22 arranged to control an air circulating fan 23.

The stand 23 as seen in Figure 5 is located in the neck portion of a substantially funnel-shaped housing 24, said housing being formed on the lower lateral branch 25 of an upstanding tubular conduit or pipe 26. The upper branch 27 of the pipe lies within the vicinity of the ceiling of the cabinet and the open end thereof is designated as the intake 28. It will be observed in Figure 5 that the discharge end of the housing is of such proportions that approximately one-half communicates with the lower chamber or compartment 20 while the upper half discharges into the lower portion of the upper compartment 19.

This housing serves to accommodate the

electric fan equipped heater generally denoted by the numeral 29. This heater is of any appropriate marketed type. It is generally referred to in the trade as a fan type heater. The current supply wires indicated by the numerals 30 are connected with a heat actuated single wafer thermostat 31 supported in the upper central part of the cabinet as seen in Figure 2. Incidently the numeral 32 designates an electric receptacle designed to receive a plug 33 with which the electric house cord 34 is connected. This is conveniently located to permit the heater circuit to be cut out when cooling the eggs in the cabinet.

The numerals 35 designate removable tapered vent plugs fitted into correspondingly shaped vent holes in the top of the cabinet. The numerals 36 merely designate casters for making the structure portable.

In operation when the plug 33 is fitted in the socket or receptacle 32 the electric heater 29 is brought into play and the heated air waves are circulated from the housing 24 into the chambers 19 and 20 of the cabinet. Obviously the heat rises rapidly and the heated air accumulates in the upper portion of the cabinet. This leaves the air in the compartment 20 somewhat cooler and when the air within the vicinity of the contraction thermostat 21 becomes sufficiently cool, the thermostat 21 comes into play to automatically bring the circulating fan 23 into operation. This fan produces the requisite suction for drawing the heated air from the top of the cabinet down through the pipe 26 and returning it to the lower air level in the lower portion of the cabinet.

When the requisite uniform heated temperature is established, the fan 23 is automatically cut out. In addition, when the desired temperature is established throughout the cabinet, and should it become excessive, the expansion thermostat 31 comes into play to automatically cut out the heater. Consequently the thermostats operate in proper order and progression to maintain the requisite uniform heat so necessary in an egg hatching incubator.

Obviously the door 11 permits access to be had to the trays (not shown) for turning the eggs whenever desired. Moreover, the window 14 in the door permits inspection to be made at frequent intervals to observe the internal conditions of the incubator.

When it is desired to cool the eggs, the electric plug 33 is detached, thus throwing the heater temporarily out of operation. The door 11 is swung open and the vent plugs 35 are removed. This allows the atmospheric air to enter and the cool air affects the thermostat 21 throwing the fan 23 into operation at this time and permitting the fan to serve as a ventilator.

The fan 23 and its thermostat may be embodied in an individual circuit to permit this end to be satisfactorily accomplished.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts provided that such changes fall within the scope of the appended claims.

I claim:

1. An incubator comprising a cabinet, supporting members arranged in the lower portion of the cabinet, an elevated floor comprising a plurality of apertured plates mounted on said supporting member and arranged within the vicinity of the bottom of the cabinet, said floor dividing the cabinet into upper and lower compartments, and an electric fan-type heater supported in the lower part of the cabinet, a housing enclosing said heater and in communication with the upper and lower compartments, a tubular air conducting and distributing pipe connected at its lower end with said housing and having its upper end located within the vicinity of the ceiling of the cabinet, an electric air circulating fan mounted in said housing.

2. An incubator comprising a cabinet, supporting members arranged in the lower portion of the cabinet, an elevated floor comprising a plurality of apertured plates mounted on said supporting member and arranged within the vicinity of the bottom of the cabinet, said floor dividing the cabinet into upper and lower compartments, and an electric fan-type heater supported in the lower part of the cabinet, a housing enclosing said heater and in communication with the upper and lower compartments, a tubular air conducting and distributing pipe connected at its lower end with said housing and having its upper end located within the vicinity of the ceiling of the cabinet, an electric air circulating fan mounted in said housing, an expansion thermostat mounted in the upper portion of the cabinet and electrically connected with the heater for automatically controlling the heater, and a second contraction type thermostat mounted in said lower compartment and electric connection with said fan for the purposes stated.

3. An incubator comprising a cabinet including insulated walls, having vent holes in its top, removable vent plugs in said holes, a door formed in one wall of the cabinet and provided with a window, an elevated floor supported in the lower portion of the cabinet and composed of removable sections, said floor defining upper and lower compartments, a vertically arranged pipe supported in the cabinet and having an upper laterally directed air intake branch located within the vicinity of the ceiling of the cabinet, having its lower end directed laterally and extend-

ing into the lower compartment and terminating in an enlarged funnelshaped housing, a fan-type electric heater confined in said housing, and an air circulating fan mounted in the housing inward of the heater.

4. An incubator comprising a cabinet including insulated walls, having vent holes in its top, removable vent plugs in said holes, a door formed in one wall of the cabinet and provided with a window, an elevated floor supported in the lower portion of the cabinet and composed of removable sections, said floor defining upper and lower compartments, a vertically arranged pipe supported in the cabinet and having an upper laterally directed air intake branch located within the vicinity of the ceiling of the cabinet, having its lower end directed laterally and extending into the lower compartment and terminating in an enlarged funnel-shaped housing, a fan-type electric heater confined in said housing, an air circulating fan mounted in the housing inward of the heater, together with an automatically operable thermostat in the lower compartment electrically connected with the fan, and a second automatically operable temperature controlled thermostat mounted in the upper part of the cabinet and electrically connected with the heater.

In testimony whereof I affix my signature.

OMER V. ROOKSTOOL.