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VENTILATION SYSTEM
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3,052,176

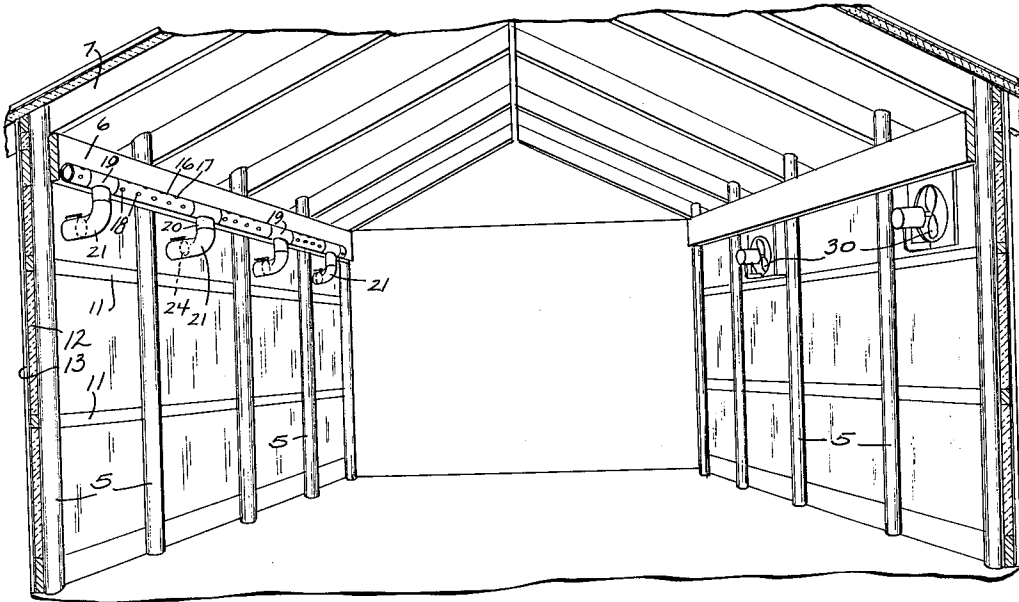


Fig. 1

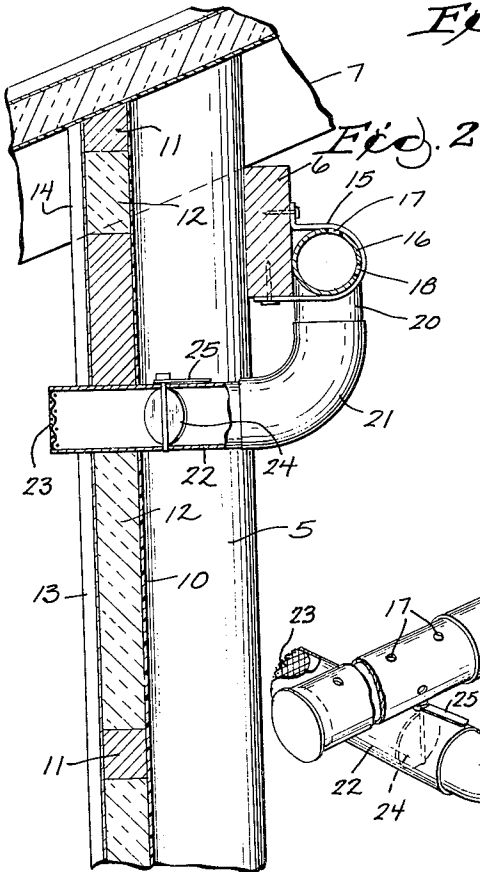


Fig. 2

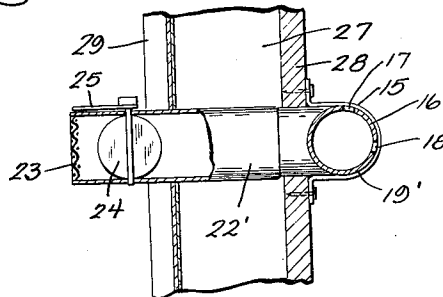


Fig. 3

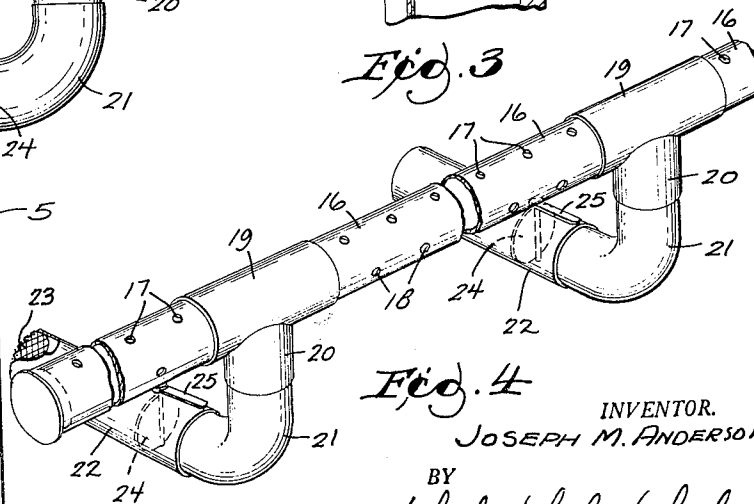


Fig. 4

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3,052,176 VENTILATION SYSTEM

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This invention relates to a ventilation system. It is particularly designed for farm buildings such as houses for farm animals or poultry.

A turkey house has been selected as an exemplification because of the fact that turkeys must be protected from drafts. At the same time, moisture resulting from metabolism must be removed with as little draft as possible. Seven thousand turkeys give off four tons of water in every twenty-four hour day.

An elongated building is provided with air inlet pipe means communicating at intervals with the outer atmosphere and opening into distribution pipes having upwardly and inwardly directed orifices of small dimension. Because of the small size of the distribution pipe orifices, the air issuing therefrom eddies and becomes rapidly mixed with the ambient air in the building. By the time it descends to the level where the turkeys are housed, there is neither any draft nor any zones of different temperature.

The air is not blown into the building but is sucked into it by exhaust fans. There are certain desirable relationships between the fan capacity and the air inlet means. These will be described below.

In the drawings:

FIG. 1 is a fragmentary view in perspective showing one end portion of a turkey house exemplifying the invention.

FIG. 2 is a fragmentary detail view on an enlarged scale in vertical transverse section through the wall of the turkey house at a point where air is admitted.

FIG. 3 is a view similar to FIG. 2 showing a modified embodiment which is employed when the building structure differs from that shown in FIG. 1.

FIG. 4 is a fragmentary detail view in perspective of a typical inlet duct installation.

The building shown in FIG. 1 is of an unusual design which is commonly used for turkey houses. Support is provided by poles 5 set in the ground at intervals. As best shown in FIG. 1 and FIG. 2, a plate 6 fastened to the poles 5 supports rafters 7 upon which the roof is fabricated.

Applied externally to the poles 5 is a film or sheet 10 of impervious material. For strength, polyethylene film is preferred. Outside of this film, purlins 11 are nailed through the film to the posts 5. The spaces between the purlins are filled with insulation batts 12 and the wall is completed by any appropriate siding 13, sheet metal being commonly used for the purpose and extended at 14 up between the rafters.

The distribution duct means applied to this type of building is desirably attached to the plate 6 by means of straps 15 or the like. In the preferred exemplification shown, the duct means include five foot lengths of four inch pipe 16 provided with holes at 17 and 18 in rows which are spaced three inches apart around the periphery of the pipe, the holes being three inches between centers in the respective rows. For pipe of this size and in the specific apparatus chosen to exemplify the invention, the holes are one-half inch in diameter. The distribution and diffusing pipes 16 are so positioned that the holes 17 are directed nearly upwardly and the holes 18 are directed nearly horizontally.

The lengths of apertured pipe 16 are connected by coupling lengths 19 which are provided with short vertical pipes 20 to which the elbows 21 are secured. To these

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elbows are attached short horizontal lengths of inlet pipe 22 which pass through the wall and desirably have screens 23 at their outer ends. In the pipe sections 22 are dampers or valves 24 which are provided between the posts 5 with control handles 25 as best shown in FIG. 2. See, also, FIG. 4.

Where a more conventional building wall structure is employed, having studs 27, an inner dry wall 28 and external sheeting at 29, the elbows are dispensed with and the coupling pipe lengths 19' have horizontal runs 22' which lead directly inwardly through the wall. The ends are provided with screens 23 exactly as in the construction first described but the dampers 24 and the control handle 25 are now located outside of the wall.

The rows of holes 17 and 18 are desirably made in flat sheeting from which the pipe sections 16 are later rolled. No change in this regard is involved, whether the structure is that of FIGS. 1, 2 and 4 or that of FIG. 3. In some installations, even smaller distribution pipes have been used. In the case of a three inch pipe, some of the holes therein, including all of the upright holes 17 and half of the horizontal holes 18, are three-eighths inch rather than one-half inch in diameter.

Desirably, I do not provide separate fans to blow air into each of the intake pipes 22, as these are quite close together in the preferred construction shown, and would require a large number of fans. Instead, I use exhaust fans as indicated in FIG. 1 at 30. About seven such fans will suffice for a turkey house two hundred feet long and seventy-six feet wide.

There is, of course, a relationship between the exhaust fan capacity and the size of the inlet ducts and the size of the inlet ports 17 and 18. The inlet duct and port dimensions given are those used in installations in which there are seven exhaust fans each having an approximate capacity of twenty-five hundred cubic feet per minute.

I claim:

1. A ventilation system for a building having opposed walls which comprises the provision of opposed inlet and outlet means, the outlet means comprising exhaust fans spaced relatively widely longitudinally of the building and the inlet means comprising inlet suction ducts leading through the walls of the building at intervals materially less than the space between the fans, a distribution pipe extending longitudinally of the building along the wall opposite an exhaust fan and communicating with the inlet ducts and having at intervals along its length orifices of small diameter whereby air drawn into the building through said ducts and distributed by said pipe is diffused into the air in the building substantially without draft.

2. The device of claim 1 in which certain of said orifices are directed upwardly from said pipe and others of said orifices are directed inwardly from said pipe.

3. In a ventilation system comprising an elongated building having opposing side walls, exhaust fans spaced along one of said walls, suction inlet pipes for ventilating air spaced along the other of said walls, and a distribution pipe with which said inlet pipes communicate, said distribution pipe having small orifices along its upper side and small orifices along its inner side for admitting and diffusing air admitted to said building to replace air exhausted therefrom by said fans.

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