

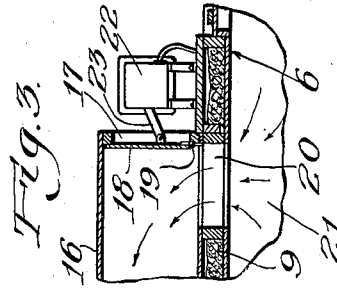
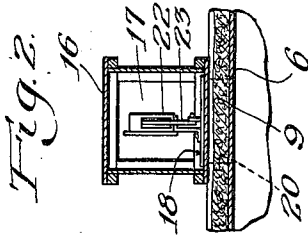
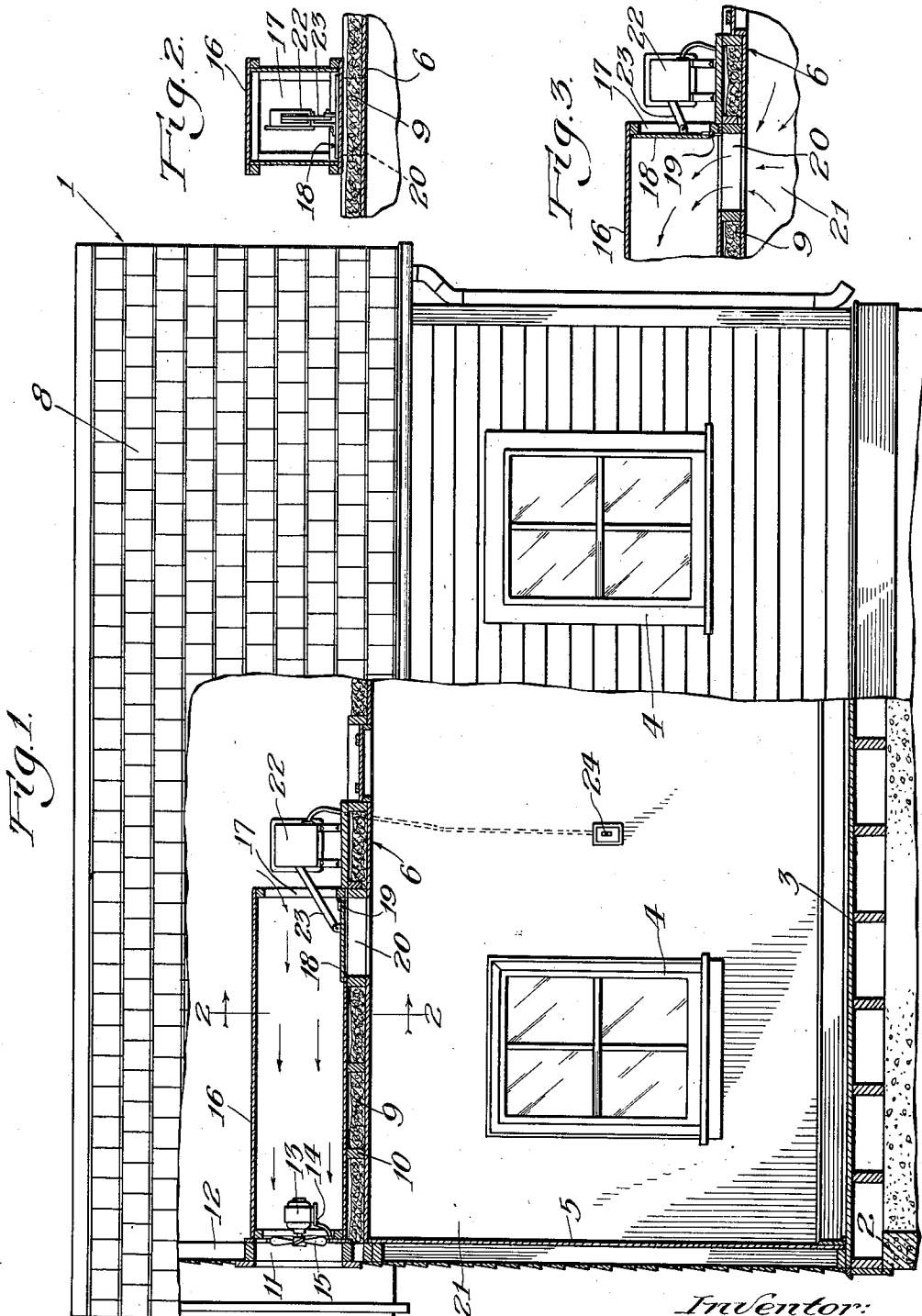
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VENTILATING SYSTEM

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VENTILATING SYSTEM

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2 Claims. (Cl. 98—43)

This invention relates to improvements in cooling systems for buildings and refers specifically to means and a method of periodically exhausting or changing the air in various compartments of a dwelling house as the outside air temperature varies.

The present day dwelling houses or residences usually have a peaked or gabled roof construction whereby an attic is provided between the roof and the ceiling of the living quarters. Even with flat roofed houses more or less space is provided between the roof and the ceiling of the living compartments. In the summer time or during hot sunny weather the heat of such an attic or space is terrific due to the steady beating of the sun's rays upon the roof. To prevent said heat from passing to the living quarters, most modern houses are provided with insulated ceilings which tend in a measure to prevent the passage of heat from the attic to the living quarters. However, even with efficient insulation consistent with practical economy, much of the heat from the attic or space beneath the roof passes to the upper living quarters.

In addition, during very hot days, the temperature of the usual living quarters is materially raised and after sundown in most localities, the outside air temperature is considerably lower than the temperature within the house. However, even after the temperature of the outside air has decreased to a comfortable degree, the temperature within the house still remains uncomfortably high until early the next morning. This undesirable condition is even more pronounced in insulated houses than those which are uninsulated.

In artificially cooled or air conditioned houses, these hereinbefore described effects are also present though not so apparent because of the tendency of the cooling or air conditioning apparatus to maintain a constant comfortable temperature. However, whether physically noticeable or not, the effect is reflected in the power consumed by the cooling or conditioning apparatus and in the resulting monthly bills.

As a feature of my invention a method is provided which in general prevents the accumulation of large quantities of attic heat during the day and the consequent raising of the temperature of the living quarters from this source of heat, and after sundown when the outside air is cooled my method contemplates the rapid circulation of said cooled air through the house. In other words, my invention contemplates obtaining for the living quarters an average rela-

tively constant temperature midway in intensity between the outside temperatures during the sun up period and the sundown period.

Briefly described, my invention comprises circulating and replenishing the attic air during the sun up or day time period to dissipate or prevent the accumulation of air in the attic at abnormally high temperatures and during the sun down or night time period utilizing the same circulation to cause rapid infiltration of the cool night air into the living quarters.

Other objects and advantages of my invention will be apparent from the accompanying drawing and following detailed description.

In the drawing, Fig. 1 is a side elevational view, parts being broken away and parts being shown in section, of a residence equipped with apparatus suitable for carrying out my invention.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary detail sectional view of a portion of the apparatus in its sundown or night time position.

Referring in detail to the drawing, 1 indicates a residence or dwelling house of conventional construction, having a foundation 2, floor 3, windows 4, walls 5, ceiling 6, attic 7, and roof 8. For purposes of illustration the roof is shown as being of peaked or gabled construction but it is to be understood that the concept of my invention is equally applicable to flat roofed buildings whether dwelling houses or used for other purposes, so long as a space is provided between the roof and ceiling.

For purposes of illustration the ceiling 6 is shown as being provided with insulation 9, carried by the ceiling between rafters 10. However, whether the ceiling is or is not insulated, or whether all of the walls are insulated or the house is or is not provided with an air cooling or conditioning device, the principles of my invention are equally applicable.

To carry out my invention an opening 11 is provided preferably in an end of the wall 12 of attic 7 or said opening may connect into the space between a flat roof (not shown) and the ceiling in the event that my invention is to be utilized in a flat roofed building. A motor 13 mounted upon a suitable support 14 may be mounted adjacent opening 11, said motor carrying a fan 15. The opening 11 may connect into a conduit 16 which may extend into the attic preferably to approximately the center thereof. The conduit 16, of

course, may be of square, circular or other desired cross sectional contour.

An opening 17 may be provided at the inner end of the conduit 16 which may provide communication between the attic and the outside. A movable partition or closure 18 may be hingedly mounted, as at 19, in such position that the same may be swung over opening 17, as shown best in Fig. 3.

An opening 20 may be provided in ceiling 6 adjacent the end of conduit 16 and is so positioned with respect to closure 18 that the latter, when in horizontal position, closes opening 20. Hence, the arrangement is such that, when closure or partition 18 is in vertical position, conduit 16 and the living quarters 21 are in communication and when the partition 18 is in horizontal position, conduit 16 and the attic are in communication.

An actuating mechanism 22 may be mounted upon the attic floor outside the mouth 17 of conduit 16, said device being provided with an actuating arm 23 which is connected at its end to closure 18. The function of the mechanism 22 is to swing closure 18 from horizontal to vertical position or vice versa as occasion demands. The details of mechanism 22 are not described since the same may comprise any suitable mechanical arrangement which is preferably electrically operated so that the position of closure 18 may be conveniently changed by manipulating switch 24 positioned on the wall of the living quarters 21.

During the day time in hot weather, the rays of the sun striking roof 8 tend to heat the air within attic 7 to an abnormal intensity materially greater than outside air temperatures. If the air within the attic is permitted to remain stagnant the heat accumulation in the attic is enormous. Whether the ceiling 6 is insulated or not this heat is conducted to the living quarters 21 thereby raising the temperature therein. Of course, if the ceiling is insulated, the rate of heat transfer will be less than if it is uninsulated, but to date no insulation has yet been proposed which if used in practical quantities can withstand hours of the great temperature differential between the attic and living quarters. Moreover, if the living quarters are artificially cooled this differential will be even greater and consequently the cooling unit will be run at capacity to maintain comfortable conditions in the living quarters.

By the provision of my invention, fan 15 may be operated to preferably induce air through conduit 16 from attic 7, closure 18, of course, then being in horizontal position. The fan, if desired, may be operated in the opposite direction but preferably draws the air from the conduit as indicated by the arrows in Fig. 1. It can readily be seen that the attic air is thus exhausted through opening 11 and is replaced by air from

the outside, the air passing through windows, crevices, etc., in the attic walls and roof. In this manner the attic air is never permitted to remain stagnant and the average temperature of the attic air is brought to substantially the temperature of the outside air, whereas otherwise it would be from 50 to 100 degrees higher.

In addition, by providing conduit 16 and establishing communication adjacent the center of the attic space the air of the entire attic is kept at a substantially uniform temperature. If this uniformity of temperature were to be maintained without the use of conduit 16 or its equivalent, a fan and motor of approximately 4 to 6 times the capacity would be necessary to accomplish the same results depending upon the volume and dimensions of the attic.

During the night or when the temperature of the outside air is less than the temperature within the quarters 21, switch 24 may be manipulated to swing closure 18 to its vertical position thereby effecting communication between conduit 16 and living quarters 21. With fan 15 rotating in the same direction, the warm air will be drawn from the living quarters and replenished by the cool outside air through windows, doors, etc., thereby quickly lowering the inside air temperature. At such periods, if artificial cooling or conditioning systems are used, the same may be shut off and the desired results still obtained.

It is apparent that herein is provided a method and apparatus which is ideally adaptable for home use, it being equally desirable whether the house is insulated or uninsulated, artificially cooled or not, and is especially attractive in that its cost is low and may be installed in existing houses as readily as in houses during construction.

By the use of the term "attic" in the specification and claims is meant that space between the roof and the ceiling of the living quarters.

I claim as my invention:

1. Apparatus for cooling a building having an attic and adjacent living quarters comprising in combination, a conduit having a discharge outlet to atmosphere, an air inlet connected to the attic and another air inlet connected to the living quarters, and single means for closing one of said air inlets while simultaneously opening the other.

2. A device for cooling a dwelling house having an attic and adjacent living quarters comprising in combination, a conduit opening exteriorly of the building at one end and having communication with both an intermediate portion of the attic and the living quarters at the other end, means for forcibly moving the air in said conduit and a common valve movable to selectively close the opening of said conduit to said attic or said living quarters.

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