(No Model.)

L. C. TUTTLE.

SYSTEM OF VENTILATION.

No. 389,616. Patented Sept. 18, 1888.

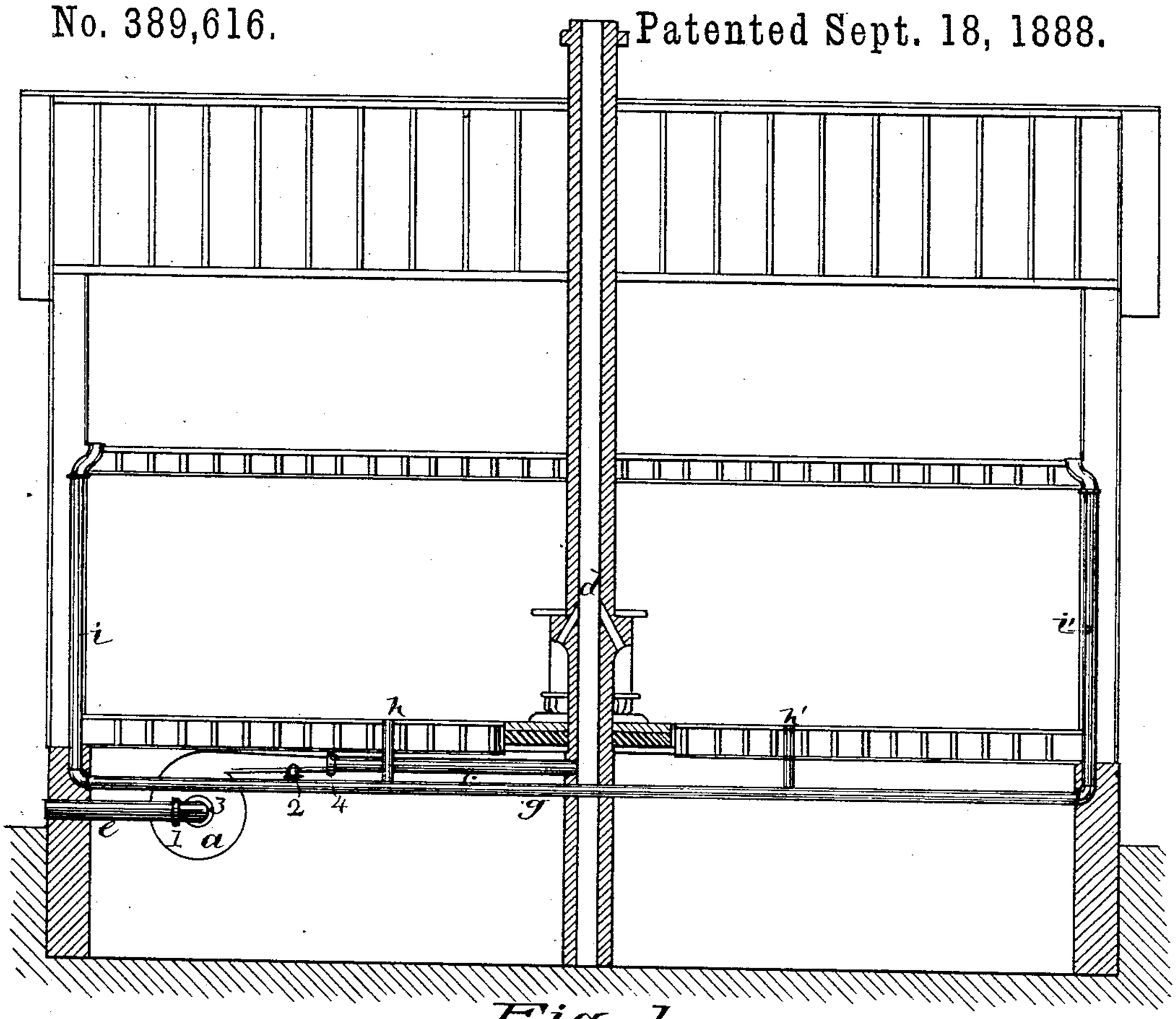

Fig. 1.

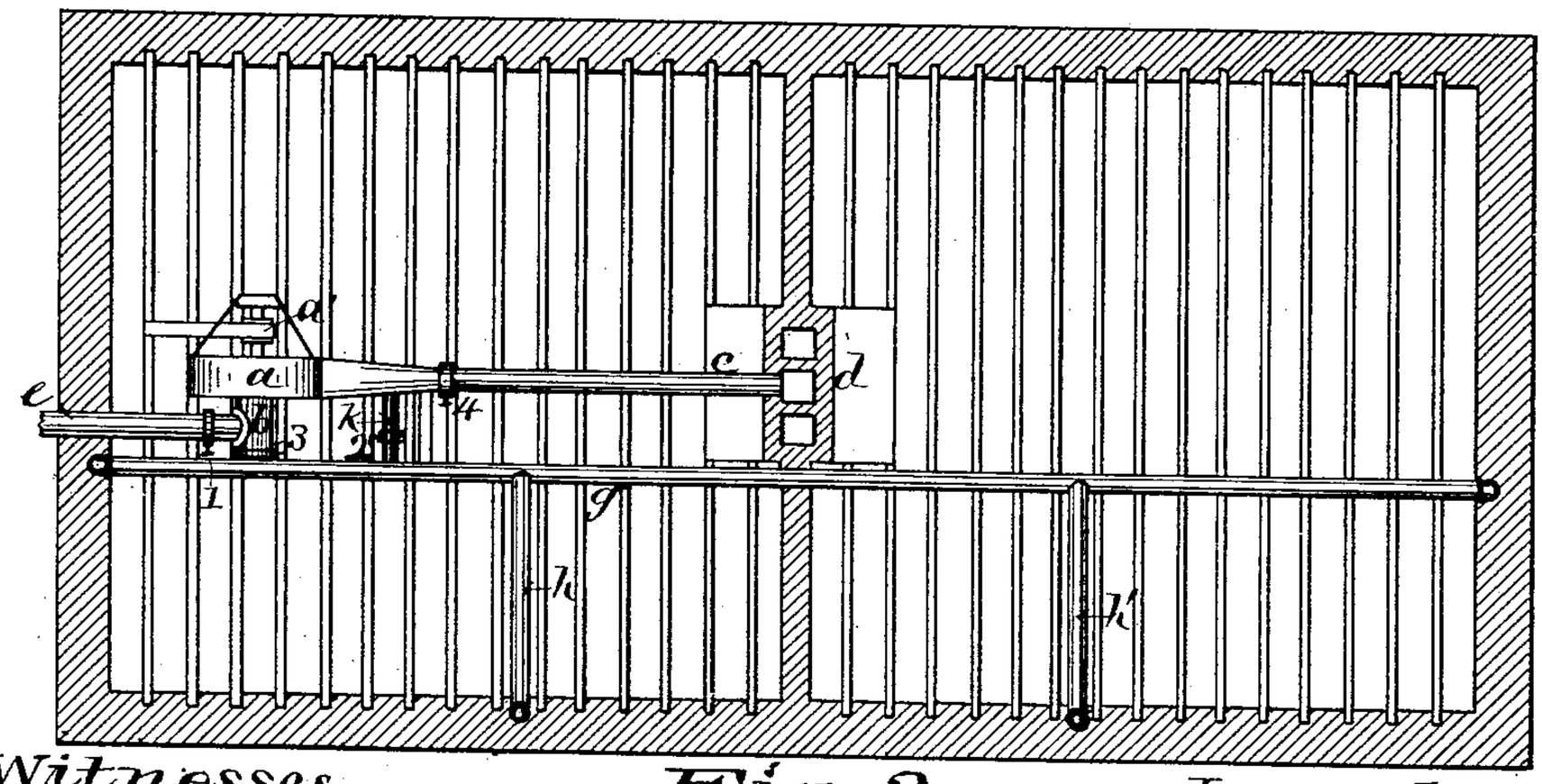

Fig. 2.

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UNITED STATES PATENT OFFICE.

LEWIS C. TUTTLE, OF CLEVELAND, OHIO, ASSIGNOR OF ONE HALF TO ANDREW KOLB, OF SAME PLACE.

SYSTEM OF VENTILATION.

SPECIFICATION forming part of Letters Patent No. 389,616, dated September 18, 1888.

Application filed March 15, 1888. Serial No. 267,286. (No model.)

To all whom it may concern:

Be it known that I, LEWIS C. TUTTLE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in a System of Ventilation; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention appertains to a system of ventilating buildings, and my object is to provide means whereby a dwelling-house, schoolhouse, public hall, or other building may be supplied with fresh air or be cleared of its foul air through the same air-tubes, substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of a building with one side removed and disclosing two floors with air-tubes extending thereto from the basement. Fig. 2 is a bottom view of the lower floor, the same as would be seen by going into the basement or cellar and looking up to the joist overhead and showing the air-tubes and blower as arranged on said joist.

A peculiarity and novelty in my system of ventilation is the fact that but one set of pipes or tubes is employed to both force fresh or cool air into the building and to withdraw the foul air therefrom, and these tubes are so arranged with reference to the different floors and rooms as to perform either function in the most desirable way—that is to say, the terminals of the pipes and the ventilating-openings in the different rooms are located in or about the bottom of the rooms instead of the upper portion, so that when fresh cool air is injected it will come from the bottom, where it is needed, and force the warm air into the upper strata, and when the action is reversed and the pipes employed to exhaust the foul air the poisonous gases—such as carbonic-acid gas, which is heavier than air and settles to the bottom of the room—will be carried off and the atmosphere of the room be thus purified. Of course it is presumed that while the exhaust is going on fresh air will be supplied through the crevices about the doors and windows, which in all modern houses are amply sufficient for this purpose, and render special fresh-air openings unnecessary. It will be observed, as a further advantage of this system, that by exhausting from the bottom of the room the colder air is drawn off and the upper strata of warm air naturally settle down and take its place, thus making the exhaust an active and important agent in equalizing the temperature of a room. This system also gives life to otherwise dead air, or air that remains stagnant by reason of the absence of any force to put it in motion and give it life. The exhaust need not and will not be violent. Indeed, ordinarily it will not be perceptible except by the tone and freshness of the atmosphere, as it is felt in respiration and otherwise pleasantly and healthfully affects the person, and notwithstanding the evident air movements they are void of the injurious effects of drafts and currents.

It should have been stated that the system is employed for exhaust in the winter when the building is closed and heated, and when it is desirable to get rid of the vitiated air that unavoidably accumulates. Then when the change of season arrives and drafts of cool air are desirable, the operation of the system is reversed and the fan operates as a blast to drive air into the building.

In carrying out my invention I employ an arrangement of pipes—for example, as shown in the drawings. I say "for example, as shown," for the reason that the mere arrangement of pipes or tubes and their valves may be very greatly varied and still be within the scope of my invention; but the drawings serve to illustrate the principle on which my system is based. For convenience, I have located the main apparatus in the basement of the building and attached it to the joist overhead to have it out of the way. This apparatus consists, primarily, of a fan or blower, *a*, which may be of any well-known variety and be driven by any available power, a band-wheel, *a'*, being provided for that purpose. It will be understood that the power required is not great, and it may be clock-work, an electric motor, water-motor, or gas or other motor. This fan has an inlet-pipe, *b*, at its side and an outlet-pipe, *c*, discharging into the chim-

ney *d*. Of course a separate flue for the discharge might be used; but by conducting the discharge into the chimney I should stimulate the draft, which in most buildings is desirable.

Into the pipe or tube *b* extends a tube, *e*, which, it will be seen, runs to the outside of the building, where it is shown as broken off, and in the summer, or when fresh air is wanted, becomes the source of supply to the fan. Then at the end of tube *b*, outside of the tube *e*, is a main supply-tube, *g*, which runs the length of the building, so as to enable branch tubes to be carried therefrom to the different floors, and from these to the different rooms, as convenience and need may dictate. I have for illustration of this idea shown two distributing-tubes, *h h'*, to two different rooms on the first floor, where they open into suitably-constructed registers, which of course may be opened or closed, and two other tubes, *i i'*, which extend to the second floor and into two different rooms there. These tubes may be as many as the various rooms of a dwelling or other building shall require, and they may connect either directly with the floor or with the sides near the floor. A short cross-tube, *k*, extends between the discharge-tube *c* back of the fan to the long supply-tube *g*, and the respective tubes *b c e k* are provided with valves 1 2 3 4, located as shown, for a purpose hereinafter described. Now, in order that the fan or blower and the system of tubes thus arranged shall serve either to supply fresh air to a building or exhaust the foul air therefrom, I provide the tubes with valves 1, 2, 3, and 4. Thus, for example, if fresh air is to be furnished, I open valves 1 and 2 and close valves 3 and 4. The air will then enter through tubes *e b* into the fan and be discharged through *c k* into main tube *g*, to go thence through the branch tubes to the various rooms. On the other hand, if the system is to be employed to exhaust, I simply close valves 1 and 2 and open 3 and 4. Then the suction of the fan will be on the main pipe *g*, through *b*, and the discharge into the chimney through pipe *c*.

Any different arrangement or location of valves which would give the same results would of course fall within the scope of my invention.

If it were desired, the fresh air-induction tube could be changed into the form of a coil and packed with ice, or be otherwise surrounded to reduce the temperature of the air that passes through it.

As the invention relates, mainly, to the several tubes hereinbefore described in connection with the blower, the tubes, for convenience of reference and to distinguish one from the others, may be designated as follows: *e*, fresh-air tube; *b*, tube leading into the blower; *c*, discharge-tube; *g*, main tube, and *k* cross-tube.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a system of house-ventilating, a blower, a tube leading into the blower, having a fresh-air tube, as *e*, and a main tube, as *g*, connected therewith, a discharge-tube on the blower, and a cross-tube connecting the discharge with the supply tube, said several tubes having valves to change the direction of the flow of air, substantially as set forth.

2. In a system of house-ventilating, a blower, a tube, as *b*, for conducting air into the blower, and having a main tube, as *g*, at its end and a fresh-air tube, as *e*, between the main tube and the blower, with a shut-off valve in the tube *b* outside of tube *e*, in combination with a discharge-tube on the blower, having a shut-off valve and a valved cross-tube between said valve and the blower connecting the discharge with the main supply-tube, substantially as set forth.

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