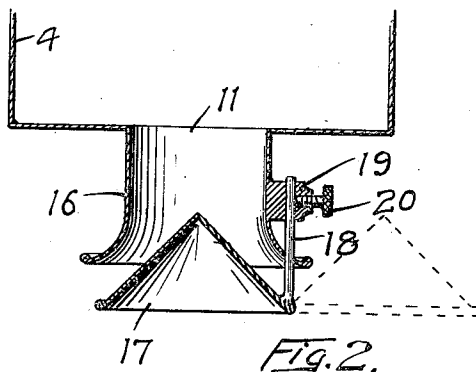
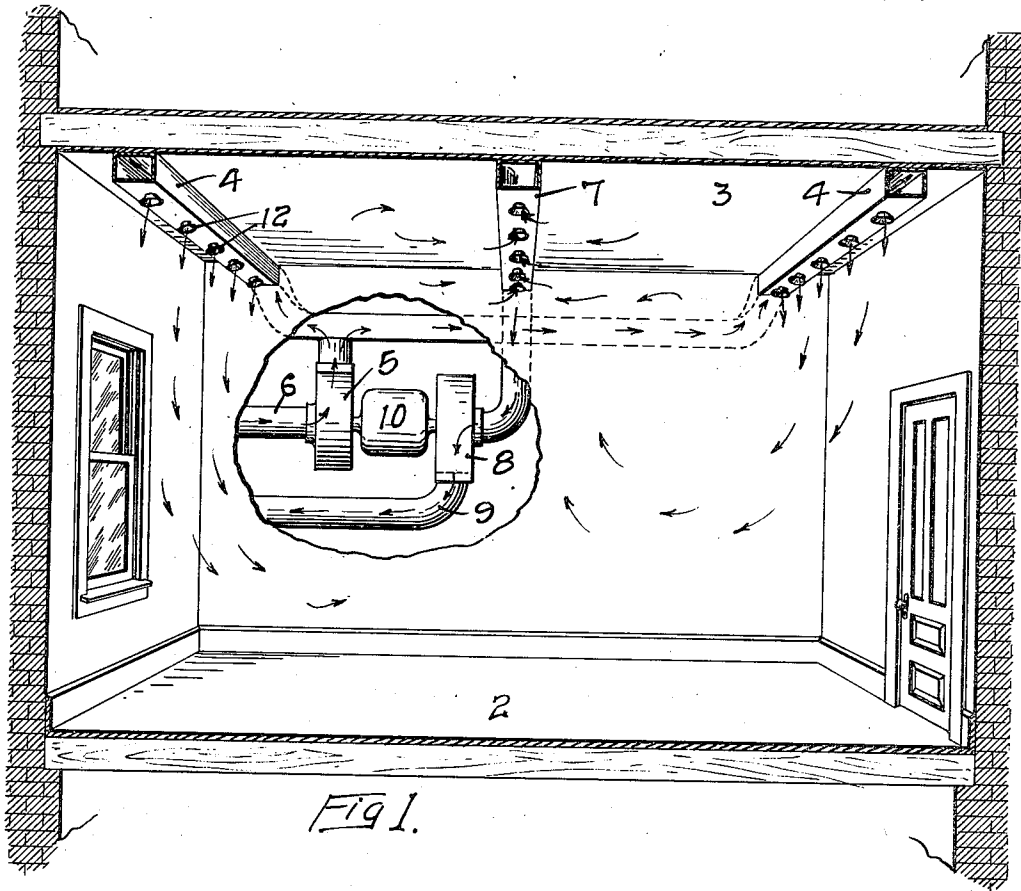


L. S. HACKNEY.
VENTILATING APPARATUS.
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1,138,470.

Patented May 4, 1915.



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VENTILATING APPARATUS.

1,138,470.

Specification of Letters Patent.

Patented May 4, 1915.

Application filed October 24, 1911. Serial No. 656,531.

To all whom it may concern:

Be it known that I, LESLIE S. HACKNEY, of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Ventilating Apparatus, of which the following is a specification.

My invention relates to ventilating apparatus by means of which fresh, pure air is introduced and the foul air removed at or near the ceiling of the room to be ventilated.

It is well known that the temperature of a room at the ceiling is always higher than at the floor, and admitting cool air well up from the breathing line and causing it to move in a downward course, it will be thoroughly warmed by the ascending currents of heated air from radiators, stoves or registers. The lower diffusion causes both the cool and warm air to spread while on their downward and upward courses respectively, with the result that instead of forming an objectionable down draft, the air in the room will be purified and be heated to a comfortable temperature by the time it reaches the breathing line.

The principle utilized in this apparatus is the introduction in a downward direction of a quantity of pure, cool air to all parts of the room to be ventilated and simultaneously removing a substantially equal volume of foul or vitiated air and at the same time maintaining a balance or ratio which will insure an ample supply of fresh air at the breathing line in all parts of the room and without creating a draft.

With this end in view my invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a perspective view illustrating the application of my invention to a room to be heated. Fig. 2 is a detail sectional view illustrating the means for spraying or distributing the incoming air currents as they pass downwardly into the room from the intake trunks.

In the drawing, 2 represents the floor of the room to be ventilated, 3 the ceiling, 4 the air intake trunks connected through the fan 5 with the air intake pipe 6, and 7 is

the foul air exhaust trunk communicating through the fan 8 with the exhaust pipe 9. These fans are operated by suitable means, such as the motor 10 disposed between them and having its shaft extending on each side for connection with the fans. This motor and the fans may be located at any suitable point in the basement or in the wall of the building or wherever it may be found most convenient for connection with the ventilating pipes and where it can be easily reached for examination. The intake air trunks 4, of which I have preferably shown two, one on each side of the room, though a greater or less number may be provided, as occasion requires, have a series of openings 11 in their bottom walls, with flaring, depending collars 12 secured to the wall of the trunk above said openings. When, therefore, the air currents are forced into the trunks 4 they will flow downwardly toward the breathing line of the room, meeting the warm air currents ascending from the radiators, stoves or registers. The outlet or exhaust trunk 7 is equipped with a similar series of collars through which the warm air ascending to the ceiling of the room will be drawn into the trunk 7 and through the fan 8 to the exhaust 9. The number of openings in the trunk will depend, of course, upon the size of the room and the amount of air that the person installing the system deems it necessary to remove in order to effect a thorough ventilation of the apartment. I do not, therefore, confine myself to the number or size of these exit openings or to the area of the trunk with which they communicate. The air forced into the trunks 4 and discharged downwardly into the room will be allowed in practice during warm weather to flow down vertically into the room and pass through the ascending currents of vitiated air.

The inlet and exhaust trunks extend throughout the space to be ventilated, in or near the ceiling, and a series of openings, preferably comparatively small, lead from the inlet trunk into the room and allow the delivery of cool, fresh air at all points simultaneously and insure the even distribution of the fresh air without causing a draft upon the occupants of the room. The foul or

vitiating air is removed in a similar manner through a number of exhaust openings, also comparatively small, preferably, and communicating with the exhaust trunk, the purpose being to draw out the foul air simultaneously from different parts of the room and provide a circulation of pure, warm air from one end of the room to the other. Evidently, by admitting the fresh air through a series of openings it is not necessary to provide such a strong intake current at any one point and I am able to not only effect a more even distribution of the fresh air in the room, but avoid the annoyance of having a strong blast of cold air flowing in at one point and an equally strong blast of foul air flowing outwardly at another point, as usually happens in ventilating systems in general use. The series of inlet openings will keep every part of the room supplied simultaneously with cool, fresh air, and the series of exhaust openings will remove the foul air at all points and every part of the room will be of substantially uniform temperature and the same degree of purity of air, and the occupant of the room at the most distant point from the fresh air intake openings will be supplied with substantially the same amount of air suitable for breathing purposes as the person near the ventilating trunk. The intake and exhaust openings being generally located in the upper part of the room, the cold air flowing in and settling will reach the breathing zone at a suitable temperature and a corresponding volume of foul air will be drawn out through the exhaust openings. The proper ratio may be easily maintained at all times and the room kept supplied with fresh pure air and without creating a draft at any point. I prefer also to arrange the inlet and exhaust trunks in substantially the same relative position with respect to the walls of the room and thereby avoid the objectionable cross currents of cool or foul air which usually result from the location of inlet openings near the floor line on one side of the room and the exhaust openings in a corresponding position on the opposite side of the room, or, even where the fresh air inlets are in the ceiling and the exhaust opening near the floor line, the occupants of the room will be subjected to the annoyance of currents of air flowing toward the exhaust openings below the breathing line.

In Fig. 2 I have shown a construction that I may employ for spraying or distributing the air as it passes downwardly from the intake trunks through the outlets in the bottom thereof. This device consists in a collar 16 and a cone 17 mounted on a rod 18 that is slidable in a support 19 on the collar and is adjustably secured therein by a set screw 20. This cone may be moved up

and down to increase or decrease the size of the exit opening, and, as indicated in dotted lines, may be revolved to a position from beneath the exit opening where it will allow the air currents to flow directly down into the room.

I do not wish to be confined to this application to the details of construction herein shown and described, as they may be modified in various ways and still be within the scope of my invention.

I claim as my invention:—

1. A ventilating apparatus comprising air inlet and exhaust trunks mounted in or near the ceiling of the room to be ventilated, in substantially parallel relation, each trunk having a series of openings arranged at intervals and communicating with said room substantially from wall to wall thereof, said inlet openings being arranged to deliver in a downwardly direction each a substantially equal volume of cool air, said outlet openings being arranged each to withdraw a substantially equal volume of vitiated air from the space to be ventilated, and means for creating forced circulation through said inlet and outlet openings to maintain a circulation of fresh air substantially downwardly from the inlets to the breathing zone and of vitiated air upwardly to the outlets.

2. A ventilating apparatus comprising air inlet and exhaust trunks mounted in or near the ceiling of the room to be ventilated, in substantially parallel relation, each trunk having a series of openings arranged at intervals and communicating with said room substantially from wall to wall thereof, said inlet openings being arranged to deliver in a downwardly direction each a substantially equal volume of cool air, said outlet openings being arranged each to withdraw a substantially equal volume of vitiated air from the space to be ventilated, a fan connected to the inlet air trunks for forcing air to said inlet openings and a fan connected to said exhaust trunks for withdrawing air from the outlet openings to maintain a circulation of fresh air downwardly from the inlets to the breathing zone and of vitiated air upwardly to the outlets.

3. A ventilating apparatus comprising air inlet and exhaust trunks mounted in or near the ceiling of the room to be ventilated, in substantially parallel relation, each trunk having a series of openings arranged at intervals and communicating with said room substantially from wall to wall thereof, said inlet openings being arranged to deliver in a downwardly direction each a substantially equal volume of cool air, said outlet openings being arranged each to withdraw a substantially equal volume of vitiated air from the space to be ventilated, said inlet openings being provided with devices to assist

in guiding the incoming air downwardly,
and means for creating forced circulation
through said inlet and outlet openings to
maintain a circulation of fresh air substan-
5 tially downwardly from the inlet to the
breathing zone and of vitiated air upwardly
to the outlets.

In witness whereof, I have hereunto set
my hand this 18 day of October, 1911.

LESLIE S. HACKNEY.

Witnesses:

ASHLEY COFFMAN,
LOUIS JOHNSON.