No. 875,007. PATENTED DEC. 31, 1907.

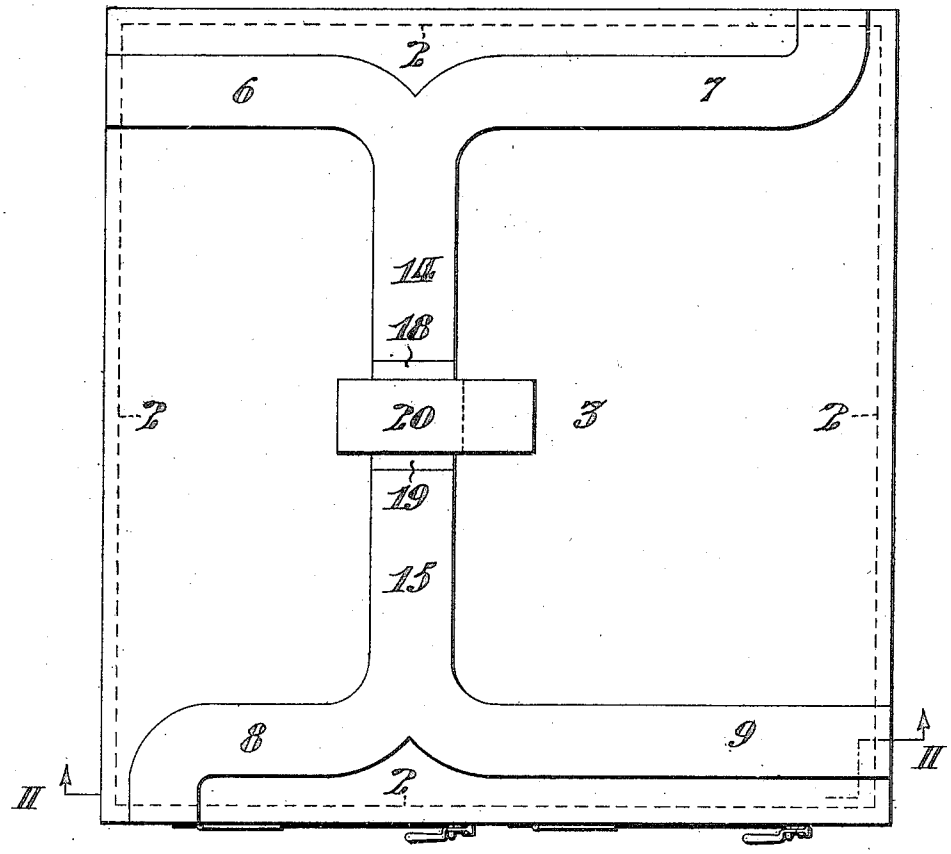
G. D. SPIELBERGER.

VENTILATOR.

APPLICATION FILED JUNE 22, 1907.

5 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

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No. 875,007. PATENTED DEC. 31, 1907.

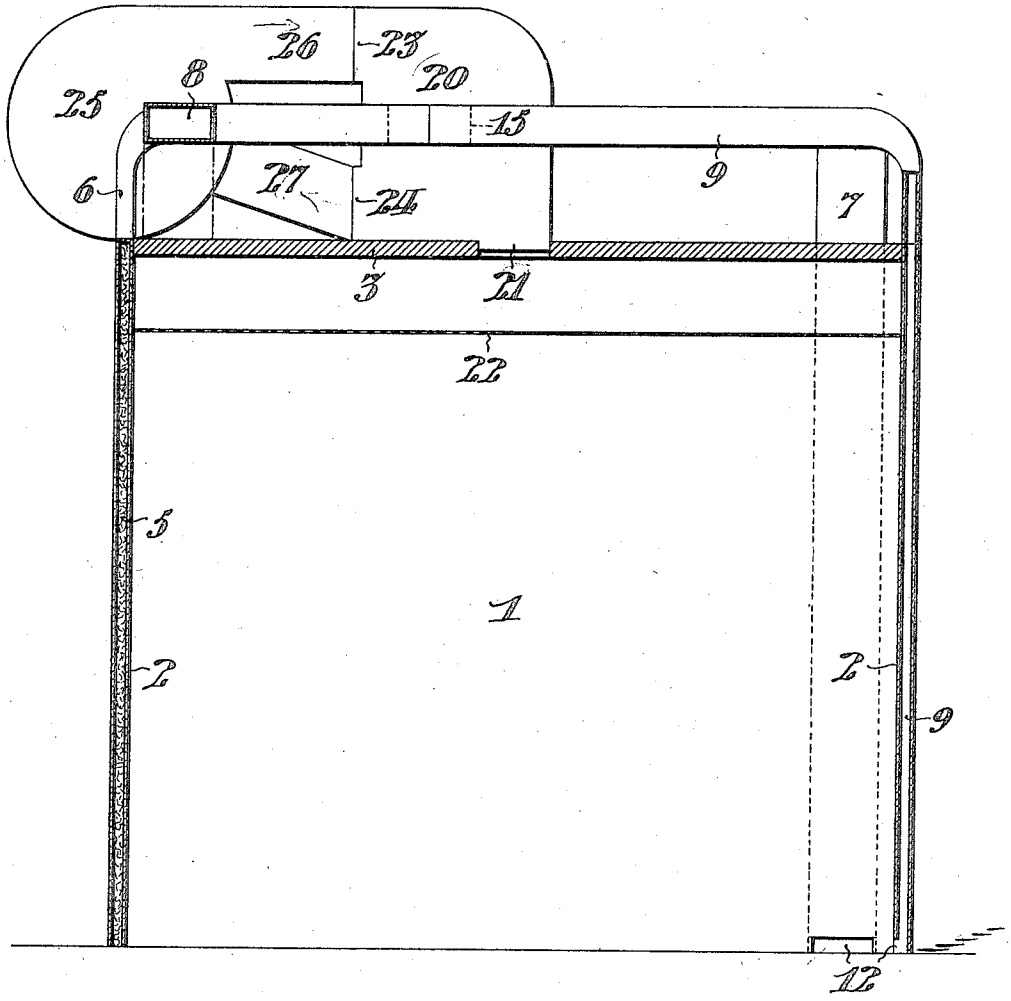
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5 SHEETS—SHEET 2.

FIG. II.



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No. 875,007. PATENTED DEC. 31, 1907.

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5 SHEETS—SHEET 3.

FIG. III.

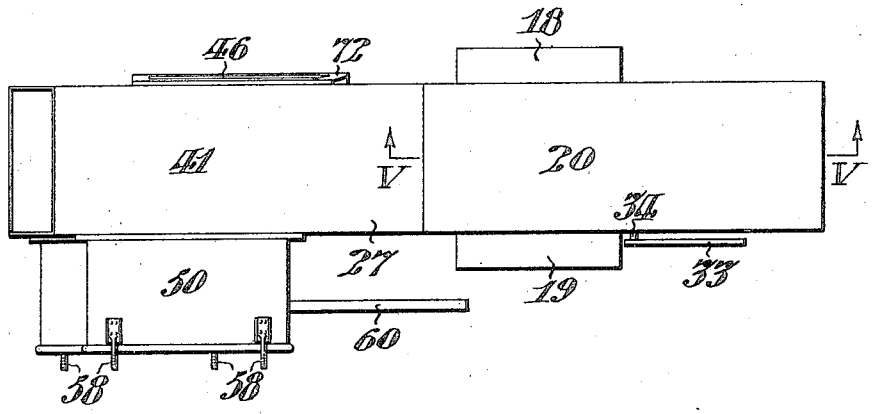
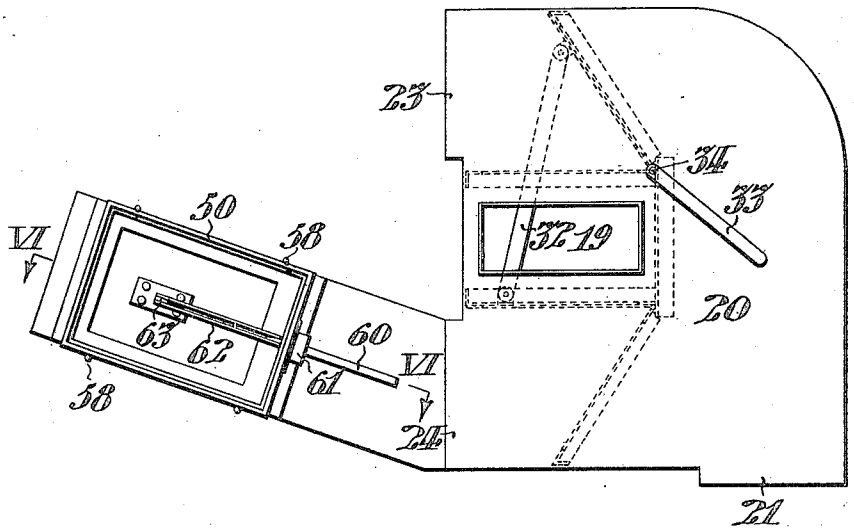


FIG. IV.



WITNESSES:

Clifton C. Hallowell

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No. 875,007. PATENTED DEC. 31, 1907.

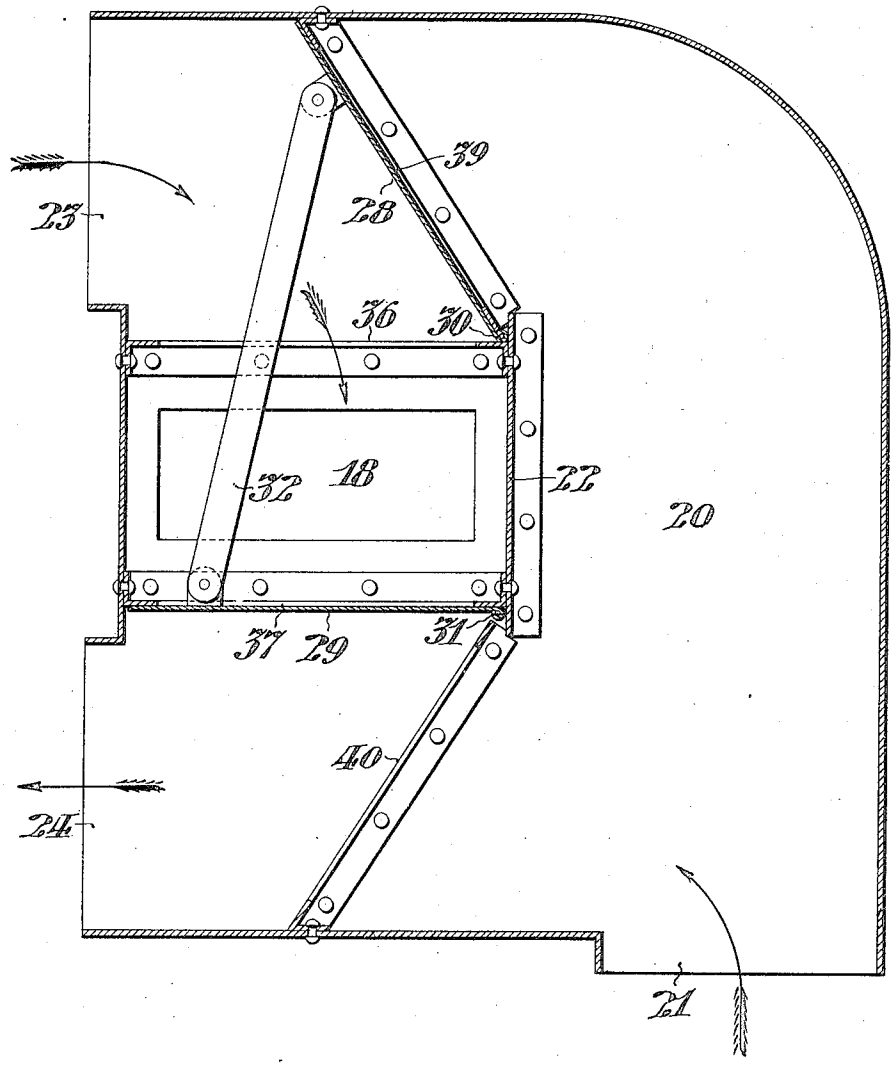
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APPLICATION FILED JUNE 22, 1907.

5 SHEETS—SHEET 4.

FIG. V.



WITNESSES:

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No. 875,007. PATENTED DEC. 31, 1907.

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APPLICATION FILED JUNE 22, 1907.

6 SHEETS—SHEET 5.

FIG. VI.

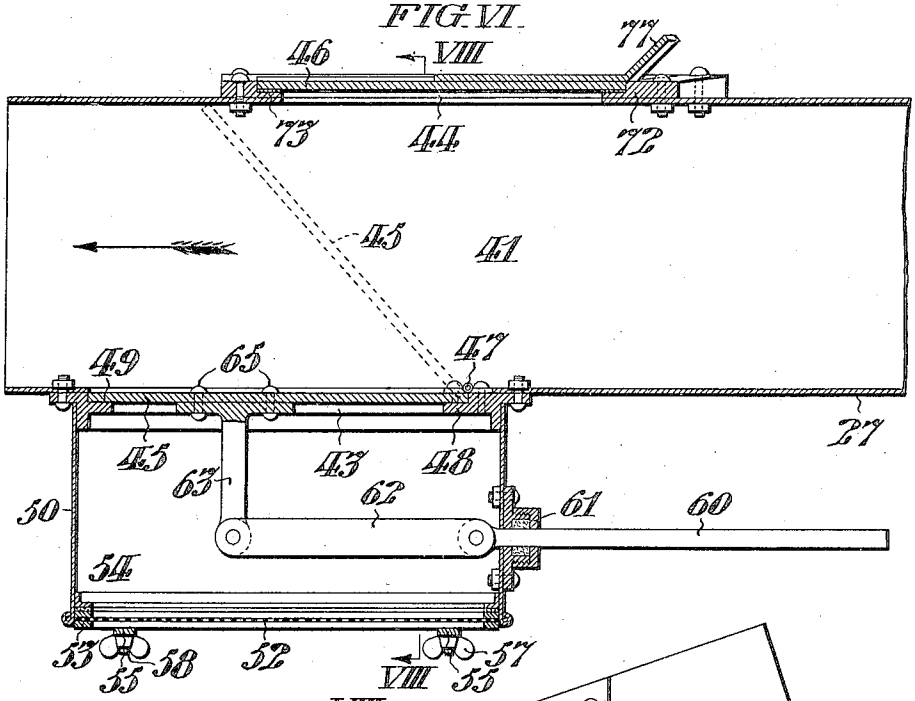


FIG. VII.

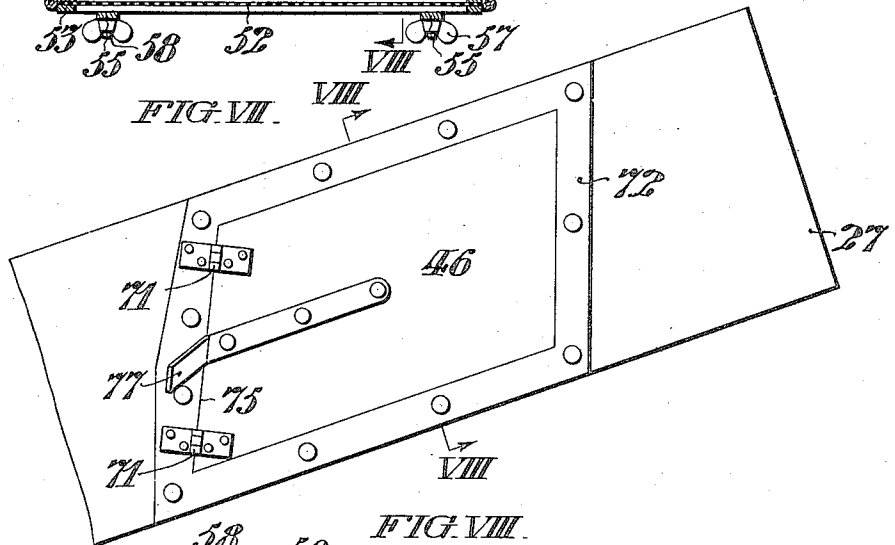
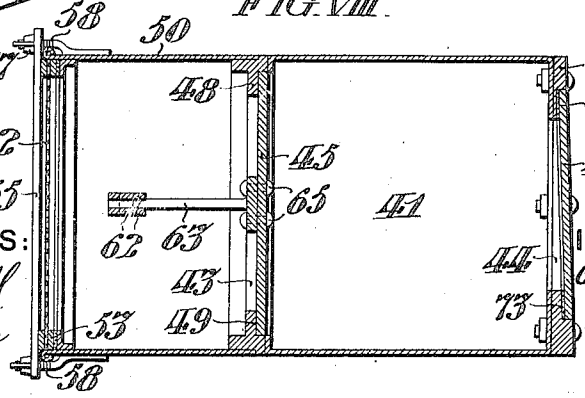


FIG. VIII.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

GEORGE D. SPIELBERGER, OF PHILADELPHIA, PENNSYLVANIA.

VENTILATOR.

No. 875,007. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed June 22, 1907. Serial No. 380,199.

To all whom it may concern:

Be it known that I, GEORGE D. SPIELBERGER, of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Ventilators, whereof the following is a specification, reference being had to the accompanying drawings.

My improvement is particularly applicable to a normally closed system for circulating air in a drying room, by forcing air into the room at one region and drawing it from another region, and, comprises means for reversing the direction of circulation, and means for admitting fresh air and expelling stale or saturated air from the system contemporaneously, at intervals, at the will of the operator.

In the ventilating system hereinafter described, air is normally admitted to a drying room through several inlets adjacent to the floor thereof, which each direct a current of air tangentially with respect to a circle concentric with the room, so as to insure that the air shall circulate around the room as it rises from said inlets to an outlet in the ceiling. Said inlets and outlet are connected with a rotary fan by ducts which extend through what is hereinafter termed a "reversing box" which is located between said room and fan and comprises two flap valves, coupled so as to be alternately opened and closed to reverse the direction of circulation of air with respect to the room. Said system also comprises what is hereinafter termed a "port box" which includes a duct between said fan and reversing box, and comprises doors whereby two ports leading from said duct to the outer atmosphere are so controlled as to admit fresh air at one port and discharge stale saturated air at the other port, when it is desired to renew the air in circulation in the system; said ports being maintained closed during the normal operation of the system.

My invention includes the various novel features of construction and arrangement hereinafter more definitely specified.

In the accompanying drawings; Figure I, is a plan view of a room arranged to be ventilated by a system, conveniently embodying my invention. Fig. II, is a vertical sectional view of said room, taken on the line II, II, in Fig. I. Fig. III, is a plan view of the reversing box in connection with the port box. Fig. IV, is a side elevation of said reversing box and port box. Fig. V, is a central vertical longitudinal sectional view of said reversing box, on the line V, V, in Fig. III. Fig. VI, is a plan sectional view of the port box, taken on the line VI, VI, in Fig. IV. Fig. VII, is a side elevation of the port box, as seen from the upper side of Fig. VI. Fig. VIII, is a transverse sectional view of said port box, taken on the line VIII, VIII, in Figs. VI and VII.

As shown in Figs. I and II, the room 1, comprises the walls 2, and roof 3. Said walls 2, inclose a packing 5, of any suitable material, which is a nonconductor of heat, and comprise air ducts 6, 7, 8, and 9, which communicate with the room through the inlets 12, adjacent to the floor thereof. Said ducts 6, 7, 8, and 9, are connected by the ducts 14, and 15, with the ports 18, and 19, of the reversing box 20, which is provided with the port 21, opening through the roof 3, into the room 1, above the foraminous screen 22. Said reversing box 20, also comprises the ports 23, and 24, connected with the rotary fan 25, by the ducts 26, and 27. As best shown in Fig. V; said reversing box 20, comprises the stationary partition 22, and the flap valves 28, and 29, which are respectively pivoted at 30, and 31, in connection with said partition 22. Said valves are coupled by the link 32, so as to be shifted contemporaneously by the lever 33, on the shaft 34, of the valve 28, to determine the direction of the flow of air through said box 20, and the room 1, connected therewith as above described. Said valves 28, and 29, respectively coöperate with the seats 36, and 37, to control the passage of air through the ports 18, and 19, and with the seats 39, and 40, to control the passage of air through the port 21.

It may be observed that the seats 36, and 39, of the valve 28, are disposed in angular relation, radially with respect to the pivot 30, of said valve, and, the seats 37, and 40, of the valve 29, are likewise disposed in angular relation, radially with respect to the pivot 31, of said valve, so that said valves engage their respective seats in substantially air tight relation.

It may be observed that although the direction of flow of air between the fan 25, and the reversing box 20, through the ports 23, and 24, is invariable; the direction of flow through the ports 18, and 19, and the port

21, is variably determined by the position of said valves 28, and 29. For instance, as shown in Fig. V, said valves 28, and 29, are set to direct the flow of air through said ports in the direction of the arrows, but when shifted so that the valves 28, and 29, engage their respective seats 36, and 40, the flow of air through the ports 18, and 19, and, 21, will be reversed.

In order to conveniently expel the saturated air from the system and admit fresh air; I have provided the port box 41, shown in Figs. VI, VII and VIII, which is included in the duct 27, between the fan 25, and the reversing box 20, and comprises the fresh air inlet port 43, and the saturated air outlet port 44, which are controlled so as to renew the air in the system at intervals, as follows:—Said inlet port 43, and outlet port 44, are normally maintained closed by the respective doors 45, and 46. Said inlet port door 45, is pivoted at 47, to the frame 48, which comprises the plane seat 49, to which said door is fitted. Said inlet port 43, is surrounded by the casing 50, which communicates with the atmosphere through the removable foraminous screen 52, which excludes particles of dust, etc., from the air which is admitted through said inlet port. Said screen 52, is provided with the frame 53, which is held against the shoulder 54, in the casing 50, by the bars 55, which latter are engaged with said frame 53, by the thumb nuts 57, on the screws 58, secured to said casing 50, as best shown in Fig. VIII. The door 45, is conveniently operated by the rod 60, which extends through the stuffing box 61, in the casing 50, and is connected by the links 62, pivoted to said rod 60, with the lever 63, secured to said door by the rivets 65. As best shown in Figs. VII and VIII; said outlet door 46, is hinged at 71, on the frame 72, and fitted to the plane seat 73, in said frame. It is to be noted that the pivotal axis 75, of said door 46, is inclined from the perpendicular, both inwardly toward the port box 41, and toward said port 44, at the top thereof, so that said door 46, is normally maintained closed by its gravitation towards its seat 73, and is only opened when an abnormal air pressure is generated within the conduit 27. When the door 45, is shifted to the position shown in dotted lines in Fig. VI; the air passage in the duct 27, is obstructed thereby, and consequently the air pressure behind said door 45, increases sufficiently to automatically open the outlet door 46, through which the saturated or stale air escapes until the entire system is supplied with fresh air, through the inlet port 43, whereupon the inlet door 45, being manually closed upon its seat 48, by shifting the rod 60, said outlet door 46, automatically closes upon its seat 73, by its gravitation. The opening movement of said outlet door 46, is limited by the stop 77, which is carried by said door and arranged to engage the frame 72, when said door is opened.

I do not desire to limit myself to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention, as defined in the appended claims.

I claim:—

1. In a ventilating system, the combination with a fan arranged to circulate air in said system; of a door within said system arranged to be shifted to permit the entry of fresh air thereto, and to permit the saturated air to escape from said system; and, means arranged to actuate said door, substantially as set forth.

2. In a ventilating system, the combination with means arranged to circulate air in said system; of means arranged to reverse the direction of flow of air in said system; and means within said system arranged to renew the supply of air, substantially as set forth.

3. In a ventilating system, the combination with a fan arranged to circulate air in said system; of means distinct from said fan, arranged to reverse the direction of the flow of air in said system; and, means within said system, distinct from said fan, arranged to be shifted to close the normal passageway in said system, and thereby direct the air therefrom to the atmosphere, and renew the supply of air, substantially as set forth.

4. In a ventilating system, the combination with a fan arranged to circulate air in said system; of means comprising a flap valve arranged to reverse the direction of circulation; and, means comprising a door within said system arranged to be shifted to renew the supply of air, and to intercept the passage of air through said system, and direct it therefrom to the atmosphere, substantially as set forth.

5. In a ventilating system, comprising an air inlet and outlet, the combination with a fan arranged to circulate air in said system; of means comprising opposed flap valves arranged to reverse the direction of circulation; and, means comprising a door arranged to normally close said air inlet, but capable of being shifted to contemporaneously open said inlet and intercept the normal passage of air through said system, and thereby discharge air from said system through said outlet, substantially as set forth.

6. In a ventilating system, the combination with a fan arranged to circulate air in said system; of means comprising opposed flap valves linked together and arranged to reverse the direction of circulation; and, means comprising a door arranged to renew the supply of air, substantially as set forth.

7. In a ventilating system, the combina-

tion with a fan arranged to circulate air in said system; of means comprising opposed flap valves arranged to control the direction of circulation; means comprising a door arranged to renew the supply of air; and means arranged to contemporaneously operate said valves, substantially as set forth.

8. In a ventilating system, the combination with a fan arranged to circulate air through said system; of means comprising a flap valve arranged to control the direction of circulation; opposed seats for said valve; and means arranged to engage said valve with either of said seats, substantially as set forth.

9. In a ventilating system, the combination with a fan arranged to circulate air in said system; of means comprising a flap valve arranged to reverse the direction of circulation; opposed seats for said valve; means arranged to engage said valve with either of said seats; and, means comprising a door arranged to renew the supply of air, substantially as set forth.

10. In a ventilating system, the combination with a fan arranged to circulate air in said system; of a pair of flap valves; opposed seats for each of said valves; and, means whereby said valves are contemporaneously shifted from one of their respective seats to the other, to reverse the direction of circulation of air through said system, substantially as set forth.

11. In a ventilating system, the combination with a fan arranged to circulate air in said system; of a pair of flap valves; opposed, angularly disposed seats for each of said valves; and, means whereby said valves are contemporaneously shifted from one of their respective seats to the other to reverse the direction of circulation of air through said system, substantially as set forth.

12. In a ventilating system, the combination with a fan arranged to circulate air in said system; of a reversing box comprising inlet and outlet ports, and distributing ports; means whereby the direction of flow of air through said inlet and outlet ports is maintained invariable; and, means arranged to determine the variable direction of flow of air through said distributing ports, substantially as set forth.

13. In a ventilating system, comprising an inlet port and an outlet port, the combination with a fan arranged to circulate air in said system; of doors normally closing said ports; means, comprising a slide rod connected to shift said inlet door and thereby open said inlet and obstruct said system; a casing surrounding said inlet; and, a screen in said casing arranged to filter the air in said system, substantially as set forth.

14. In a ventilating system, comprising an inlet port and an outlet port, the combination with a fan arranged to circulate air in said system; of doors normally closing ports; means supporting the pivotal axis of said outlet door inclined whereby said door is normally maintained closed by its gravitation; and means arranged to shift said inlet door to open said inlet and obstruct said system; whereby the pressure of air behind said inlet door shifts said outlet door to open said outlet, substantially as set forth.

15. In a ventilating system, comprising an inlet port and an outlet port, the combination with a fan arranged to circulate air in said system; of doors normally closing said ports; means supporting the pivotal axis of said outlet door inclined from the perpendicular, whereby said door is normally maintained closed by its gravitation; and means arranged to shift said inlet door to open said inlet and obstruct said system, whereby the pressure of air behind said inlet door shifts said outlet door to open said outlet, substantially as set forth.

16. In a ventilating system, comprising an inlet port and an outlet port, the combination with a fan, arranged to circulate air in said system; of doors normally closing said ports; a frame comprising a plane seat for said outlet door and bearings supporting the pivotal axis of said outlet door, inclined from the perpendicular toward said port, at the top thereof; whereby said door is normally maintained closed by its gravitation; and, means arranged to shift said inlet door to open said inlet and obstruct said system, whereby pressure of air behind said inlet door, shifts said outlet door to open said outlet, substantially as set forth.

17. In a ventilating system, comprising an inlet port and an outlet port, the combination with a fan, arranged to circulate air in said system; of doors normally closing said ports; a frame comprising a plane seat for said outlet door and bearings supporting the pivotal axis of said outlet door, inclined from the perpendicular, both inwardly and toward said port, at the top thereof, whereby said door is normally maintained closed by its gravitation; and means arranged to shift said inlet door to open said inlet and obstruct said system, whereby pressure of air behind said inlet door, shifts said outlet door to open said outlet, substantially as set forth.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this eighth day of June 1907.

GEORGE D. SPIELBERGER.

Witnesses:

CLIFTON C. HALLOWELL,

ANNA F. GETZFREAD.