

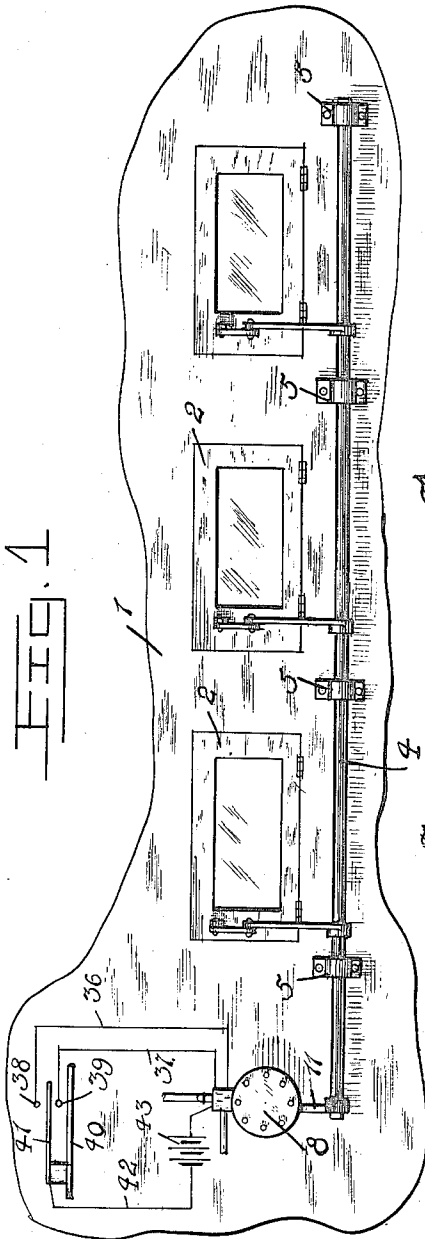
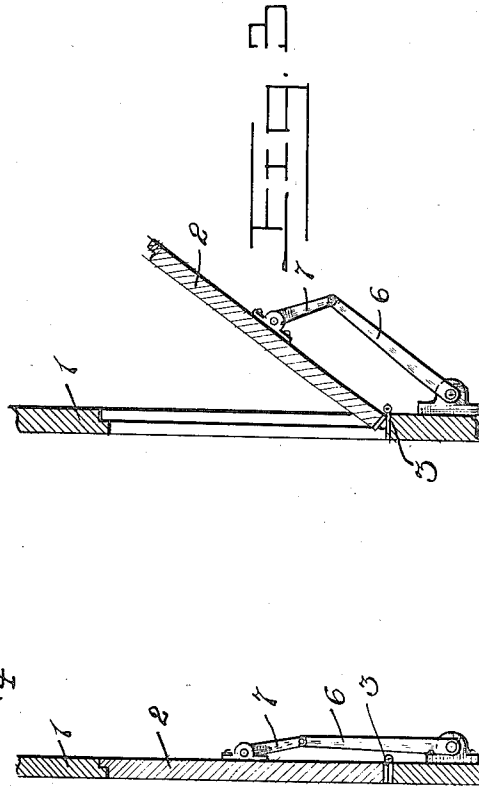
A. J. MARCOUX AND R. G. BRAY.
VENTILATOR.

APPLICATION FILED OCT. 22, 1917.

1,306,966.

Patented June 17, 1919.

3 SHEETS—SHEET 1.

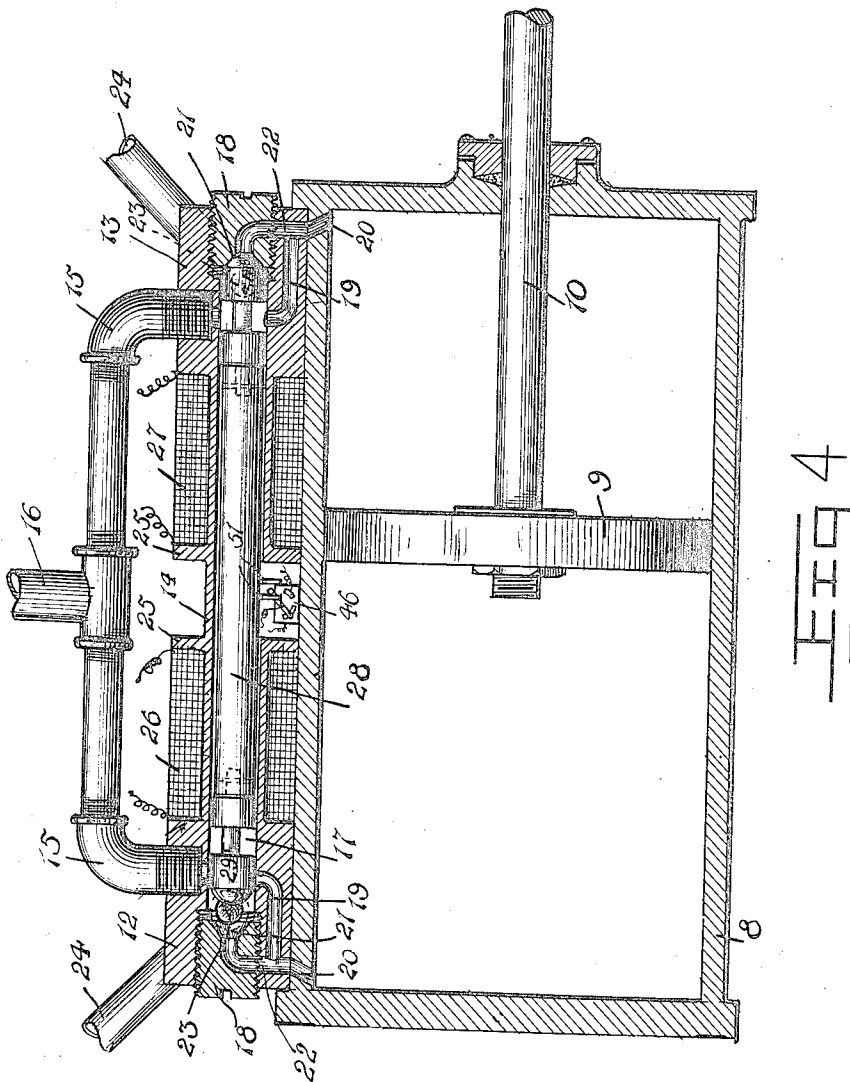


Inventors
Alexander J. Marcoux
Reginald G. Bray
By *Marion Marion*
Attorneys

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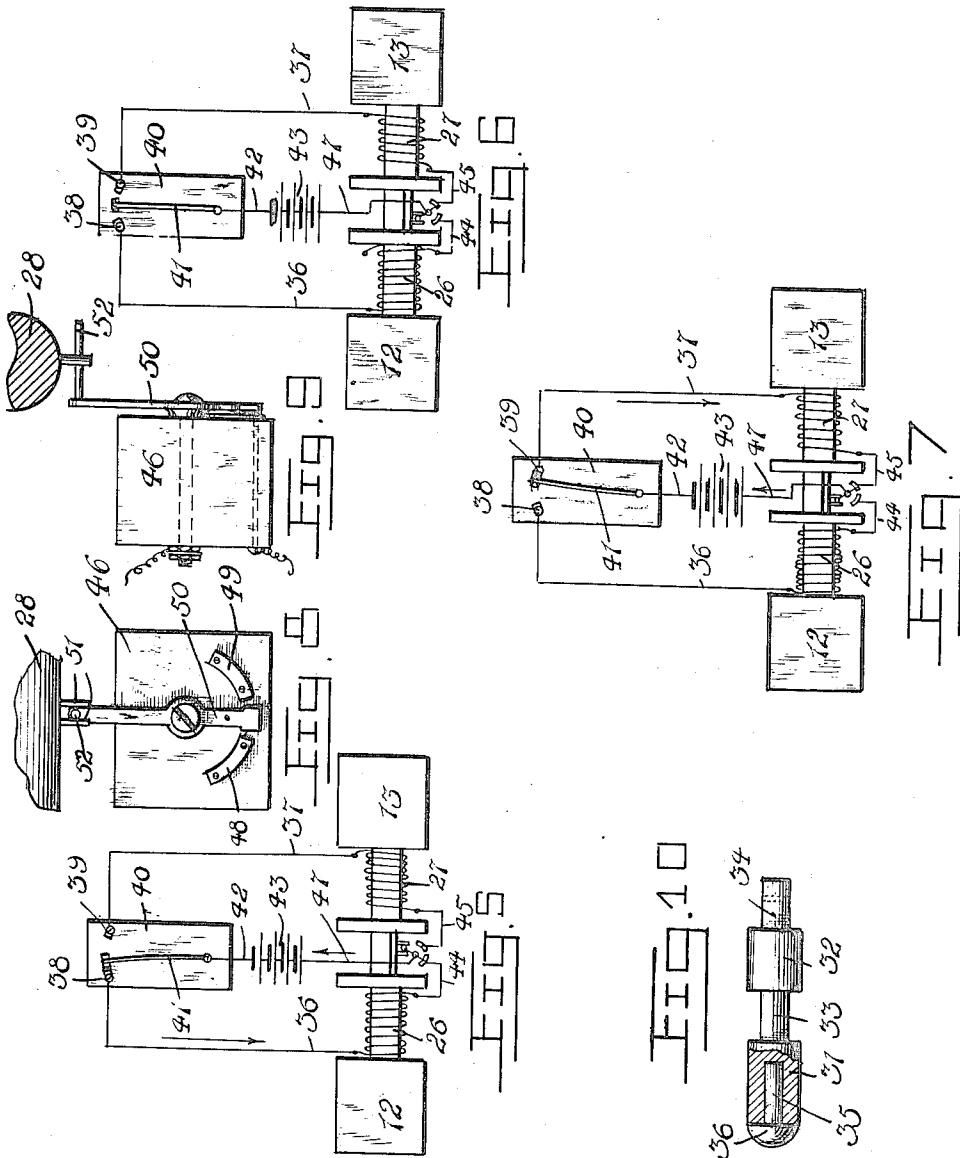
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Alexander J. Marcoux
Reginald G. Bray

Inventors

Marion & Marion

Attorneys

UNITED STATES PATENT OFFICE.

ALEXANDER J. MARCOUX AND REGINALD G. BRAY, OF SHERBROOKE, QUEBEC, CANADA.

VENTILATOR.

1,306,966.

Specification of Letters Patent. Patented June 17, 1919.

Application filed October 22, 1917. Serial No. 197,800.

To all whom it may concern:

Be it known that we, ALEXANDER J. MARCOUX and REGINALD G. BRAY, both subjects of the King of Great Britain, residing at Sherbrooke, Province of Quebec, Canada, have invented certain new and useful Improvements in Ventilators; and we do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to ventilators and more particularly to an apparatus for automatically regulating and controlling the temperature of a room, car, building or the like so that the temperature at all times will be nearly uniform.

An object of the present invention is to provide a device of this character which may be thermo electrically controlled, whereby the ventilator will be automatically controlled at all times.

With the above and other objects in view which will hereinafter appear as the description continues, the invention consists of the novel features of construction, combination and formation of parts as will be hereinafter more fully described and particularly pointed out in the appended claim.

In the accompanying drawings has been shown a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details herein exhibited, but the right is hereby reserved to any changes, alterations or modifications to which recourse may be had that come within the scope of the claim without departing from the spirit of the invention or sacrificing the efficiency of the same.

In the accompanying drawings:

Figure 1 is a diagrammatical view illustrating a plurality of windows adapted to be opened and closed by one embodiment of the present invention;

Fig. 2 is a detail vertical section illustrating the window operating means when in the position for closing the window;

Fig. 3 is a similar view showing the position of the window when open;

Fig. 4 is an enlarged vertical section through the cylinder and the valve chest therefor;

Fig. 5 is a diagrammatical view of the ap-

paratus for controlling the valves showing the positions of the various parts when the windows are open;

Fig. 6 is a similar view showing the neutral position of the thermostat and the controlling means when the windows are not being operated;

Fig. 7 is a similar view showing the position of the operating means when the windows are being closed;

Fig. 8 is an enlarged front elevation of the circuit breaking switch;

Fig. 9 is a side elevation of the same; and

Fig. 10 is a detail view of one of the valves.

Referring now more particularly to the accompanying drawings wherein like and corresponding parts are designated by similar reference characters throughout the several views.

The numeral 1 indicates the frame-work of a building or room having the windows 2 hingedly connected as at 3. In ventilating a room or car these windows are to be opened and closed, and it is the purpose of the present invention to provide an apparatus for automatically opening and closing these windows.

To jointly connect the windows 2, we provide a shaft 4 which is journaled within the bearings 5 arranged upon the frame-work 1 and this shaft is provided with a plurality of crank arms 6 which are connected to the windows 2 by means of the links 7. When the shaft 4 is oscillated in the direction of the arrow as shown in Fig. 3, the windows will be jointly opened as shown in this figure, but when the shaft is oscillated in an opposite direction the windows will be closed as shown in Fig. 2 of the drawings.

For oscillating the shaft 4 a pneumatic motor is provided which comprises a cylinder 8 having a piston 9 adapted to reciprocate therein and carried by this piston 9 is a piston rod 10. The crank arm 11 connects this piston rod 10 with the shaft 4, whereby upon the reciprocation of the piston 9 the shaft 4 will be oscillated in opposite directions.

To cause the reciprocation of this piston 9, we provide means for controlling air to the opposite ends of the cylinder 8, but, of course, it is to be understood that steam, water or other similar fluids may be used

equally as well. Arranged upon this cylinder 8 is an air chest comprising the end sections 12 and 13 respectively which are connected together by means of a tubular member 14. Communicating with the sections 12 and 13 are the branch pipes 24 of a main supply pipe, whereby air may be delivered to the air chest. These sections 12 and 13 are provided with the bores 17 and these bores are to be closed at their outer ends by means of the plugs 18. The inlets 23 communicate with the bores 17 and arranged within the sections 12 and 13 are the inlet channelways 22 which communicate with the ports 20 arranged in the opposite ends of the cylinder. The inner faces of the plugs 18 are provided with the valve seats 21 and communicating with these valve seats are the inlet channelways 22. The inlets 23 are in communication with the supply pipes 24. Arranged between the flanges 25 formed with the tube 14 and the sections 12 and 13, are the solenoids 26 and 27 respectively. A core 28 is slidably mounted within the tube 14 and has a slightly less exterior diameter than the interior diameter of the tube 14. Connected to the opposite ends of the core 28, preferably of metal and, as shown, cylindrical in general outline, are the valves 29 and 30. These valves are so arranged as to open and close the channelways 19 and 22, so as to admit and exhaust the air under pressure to the opposite ends of the cylinder 8. These valves each comprise two sections 31 and 32 which are connected by the reduced portion 33. Also formed with the valves are the stems 34 which rest within corresponding recesses formed within the opposite ends of the core 28. These stems 34 are connected to the core so that the valves will move with the core but this connection is loose, so as to prevent any binding tendency of the core during its movement. The section 31 of each of the valves is provided with a recess in which is adapted to be seated a stem 35 of a washer 36 which is preferably made of rubber and which stems seat themselves within the valve seats 21.

From the foregoing it is obvious that when the core is moved in opposite directions the valves will open and close the inlet and exhaust ports. When the core is in the position as shown in Fig. 4 the section 31 of the valve 29 will close the outlet port 15 and the channelway 19, whereas the inlet channelway 22 will be in communication with the inlet pipe 24. When the valve 30 is seated within the valve seat 21 the inlet channelway 22 and the inlet port 23 will be closed. The reduced portion 33 of this valve will be in alignment with the exhaust 15 and the exhaust channelway 19, thereby permitting a communication so that the air may be exhausted from the cylinder 8.

To cause the core 28 to travel in opposite directions, the solenoids 26 and 27 are provided so that when either of these solenoids is energized the core 28 will be attracted to the magnet which is energized, thereby opening and closing the valves 29 and 30.

The electric circuit in which the solenoids 26 and 27 are included comprises the wires 36 and 37 each having one end connected to the respective terminals of the solenoids and their opposite ends connected to the terminals 38 and 39 of the thermostat 40. The bar 41 of this thermostat is adapted to contact with the terminals 38 and 39 and connected to one end of this bar 41 is a wire 42 which leads from the battery 43. The opposite terminals of the solenoids 26 and 27 have connected thereto the wires 44 and 45 and which wires are adapted to be connected through the circuit breaking switch 46 with a wire 47 leading to the battery 43. This circuit breaking switch, as better shown in Figs. 8 and 9, comprises two terminals 48 and 49 and a swinging switch blade 50 which is adapted to contact with the terminals 48 and 49. Projecting from the core 28 are the lugs 51 and adapted to rest between these lugs is a rod 52 carried by the switch blade 50. From this it will be noted that as the solenoid moves in opposite directions, the switch blade 50 will also be oscillated so as to come in contact with the terminals 48 and 49.

The thermostat 40 is to be arranged within the room or car having the windows therein, so that as the temperature within the room rises or lowers the bar 41 will be caused to move so as to contact with the terminals 38 and 39 and when the bar so moves the solenoids will be energized so as to move the valves whereby the air under pressure will be permitted to enter into and exhaust from the cylinder 8, thereby causing the piston to move which in turn will cause the shaft 4 to oscillate, and thereby opening and closing the windows 2. When the temperature in the room increases the windows 2 should be open so as to permit air to enter the room. As the temperature in the room increases the bar 41 will assume the position as shown in Fig. 5. The electric current will then flow from the battery 43 through the wire 36, into the solenoid 26, through the switch blade 50 and finally return to the battery 43 through the wire 47. The solenoid being energized the core 28 will be attracted in this direction, thereby causing the valve 29 to open the exhaust ports within the section 12 and the valve 30 will in turn open the inlet ports within the section 13 of the air chest. When the core 28 has been attracted by the solenoid 26 it will cause the switch blade 50 to move and assume the position as shown in Fig. 7, thereby breaking this circuit and preventing

any additional current from being used as the core 28 will remain in the position moved to. The air under pressure will then pass around the valve 30 and enter the cylinder 8 for forcing the piston in one direction, whereby the shaft 4 will be oscillated and the windows 2 open. The air under pressure within this cylinder will exhaust through the section 12. When the temperature within the room decreases the bar 41 will assume the position as shown in Fig. 6 or a neutral position, wherein neither of the circuits in which the solenoids are included will be supplied with current as this bar is not in contact with either of the terminals 38 and 39. When the bar 41 is in neutral position the temperature within the room is at the desired degree. When the temperature in the room lowers to an undesired degree the bar 41 will contact with the terminal 39, thereby causing the current to pass through the magnet 27 in the direction of the arrows as shown in Fig. 7. When the electromagnet 27 has been energized the core 28 will be moved to the position as shown in Fig. 4, thereby permitting air to enter the opposite end of the cylinder 8 and exhaust through the section 13, so as to permit the piston to travel in an opposite direction which in turn will oscillate the shaft 4 and close the windows as better shown in Fig. 2. When the core 28 is moved in this direction it will cause the switch blade 50 to assume the posi-

tion as shown in Fig. 5, thereby breaking the circuit in which the magnet 27 is included. 35

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent is:

A reversing valve for reciprocal motors including, a tubular member disposed adjacent the motor cylinder having inlet and exhaust ways in its opposite ends communicating with the ends of said cylinder, the opposite portions of the way in said member being enlarged and screw-threaded, plugs having ways therein engaged in the enlarged portions and communicating with the inlet ways in the tubular member, the inner ends of the ways in the plugs forming seats, valves slidable in the end portions of the tubular member, washers detachably engaged with said valves and receivable in said seats, at times, solenoid windings arranged about portions of the tubular member, a reciprocal core in said tubular member detachably connected at its ends to said valves and adapted to be influenced by the windings, and temperature controlled circuit closing means connected to said windings for selectively energizing the same to cause reversing of the valves. 40 45 50 55 60

In witness whereof we have hereunto set our hands.

ALEXANDER J. MARCOUX.
REGINALD G. BRAY.