A. M. BERGLUND.

VENTILATING SYSTEM FOR BUILDINGS.

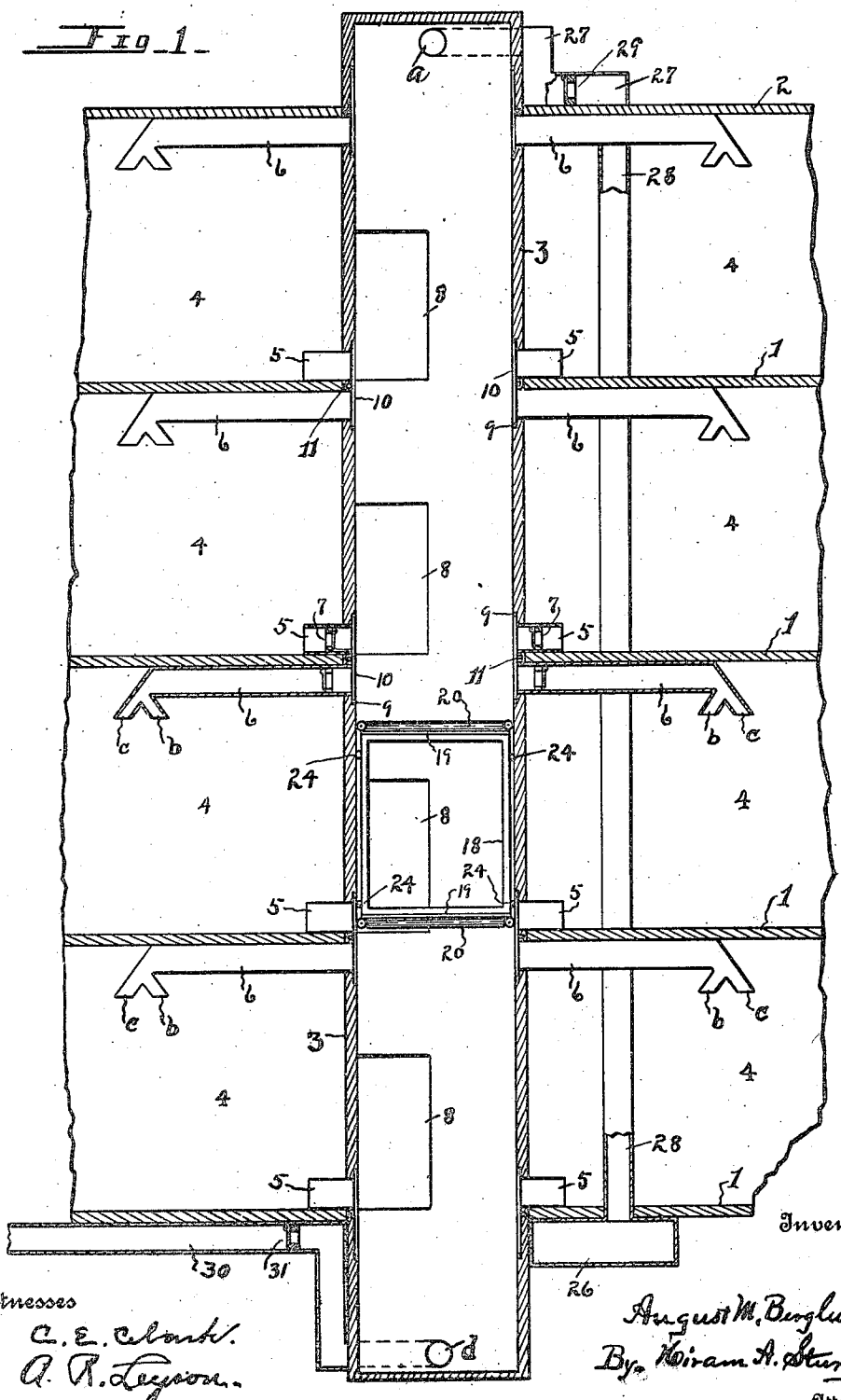
APPLICATION FILED JUNE 8, 1912.

1,052,450.

Patented Feb. 11, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

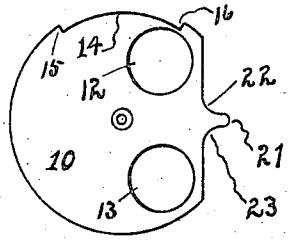

Fig. 3.

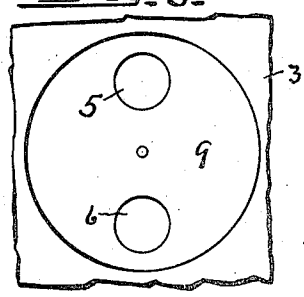

Fig. 4.

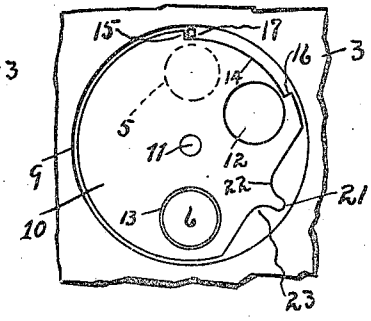

Fig. 5.

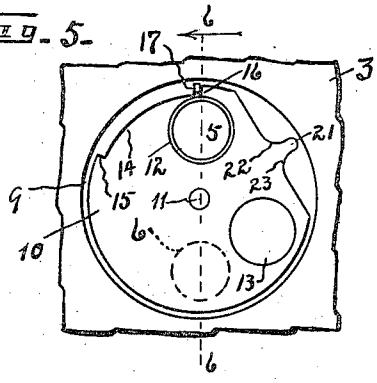

Fig. 6.

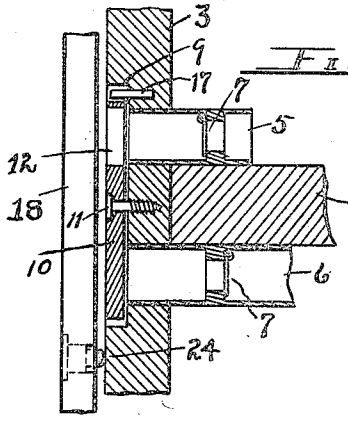

Fig. 7.

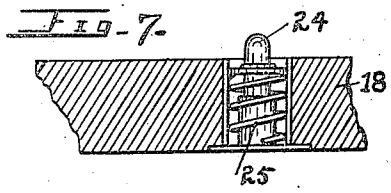

Fig. 8.

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NITED STATES PATENT OFFICE.

AUGUST M. BERGLUND, OF OMAHA, NEBRASKA.

VENTILATING SYSTEM FOR BUILDINGS.

1,052,450. Specification of Letters Patent. Patented Feb. 11, 1913.

Application filed June 8, 1912. Serial No. 702,426.

To all whom it may concern:

Be it known that I, AUGUST M. BERGLUND, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Ventilating Systems for Buildings, of which the following is a specification.

This invention relates to an improvement in ventilating systems for buildings, and has for its object to provide means for supplying fresh air and removing foul air from the rooms of a building, which may be operated by passenger or freight elevators, while moving in the elevator shafts.

The invention consists of the novel construction, combination and arrangement of parts as described herein and claimed, and as illustrated in the drawings, wherein,—

Figure 1 is a sectional view, partly broken, showing the elevator shaft, an elevator therein, and an arrangement of horizontal flues or air passageways communicating with the shaft and with the rooms of a building. Figs. 2 to 8 inclusive, are detail views showing devices for automatically opening or closing the air passageways by the movement of the elevator. Fig. 2 is a side view of an apertured disk. Fig. 3 is a face view of a circular depression, recess or disk-seat formed in the wall of the shaft. Figs. 4 and 5 show different positions of the disk when pivotally mounted in the recesses. Fig. 6 is a sectional view on line 6 6 of Fig. 5, a part of a side wall of the elevator being added. Fig. 7 is an enlarged detail showing the operating-lug for engaging the disks, a part of the side wall of the elevator cage being shown in section. Fig. 8 is a broken view showing a part of the upper end of the elevator with rollers bearing upon the vertical walls of the elevator shaft, said walls being in section to show a recess with a disk mounted therein, and to illustrate relative positions of an operating-lug and one of the cavities of a disk.

Referring now to the drawing for a more particular description, numerals 1 indicate the several floors, and 2 the roof of a building, these parts being traversed by the elevator shaft 3. Communicating with the interior of the elevator shaft and with each room 4 are comparatively short conducting pipes, flues or air passageways 5 and 6, arranged in pairs, each being provided with a valve 7. Passageways 5 are preferably located near the floors for the movement therethrough of foul air from the rooms, and the valves therefor are arranged to permit air to pass from the rooms to the shaft, but not to pass reversely. Passageways 6 are located near the ceilings of the rooms for a movement, to the rooms, of fresh air. Their valves allow air to move from the shaft into the rooms, but prevent a reverse movement of the air.

At 8 are indicated doors, and they may have any convenient mounting, one above the other, in the walls of the shaft. In two vertical walls of the shaft, opposite to each other, are formed circular depressions, recesses or disk-seats 9, and a passageway 5 and 6 open thereon. A disk 10 is disposed in each circular depression 9, with its face or front side flush with the wall of the shaft; and each of the disks is pivotally mounted, as indicated at 11, at the middle of a depression, said pivotal mounting being midway between passageways 5 and 6. Each disk is formed with apertures 12 and 13, and has a segmental portion 14 cut away to form, near its periphery, the radial stops or shoulders 15 and 16; and if the disks are partly rotated, stops 15 and 16 may engage the stationary lug 17, said lug being mounted in and near the circular wall of a depression 9, and thereby the movements of the disks will be limited to a rotatable movement in an arc of substantially 60 degrees.

At 18 is indicated the lift or elevator. It may be supported and moved vertically in the shaft by any suitable means, its top and bottom being adapted to fit within the shaft in a manner to cause the air, or the greater part of it, to move in the shaft in the same direction as the movement of the elevator, and for this purpose the top and bottom of the cage are covered with imperforate layers 19 of suitable material, and rollers 20 are mounted thereon in a manner to engage the vertical walls of the elevator shaft. The operation of the rollers tends to prevent vibration of the cage while moving in the shaft, and the layers 19 prevent a movement of air through the elevator or cage, and cause the cage to operate in a manner analogous to the piston of a pump, the air in the shaft above or below the ends of the cage being either forced or drawn, according to the direction of movement of the elevator.

Each disk is provided with a radial pro-

jection or lug 21, and each lug is formed at its sides with engaging cavities 22 and 23, these cavities being disposed, preferably, at equal distances from apertures 12 and 13.

At 24 are indicated horizontally disposed operating-lugs, two of these lugs preferably being mounted, in vertical alinement, in the two side walls of the elevator cage, as shown in Fig. 1. They are provided with springs 25 to cause them, normally, to project outwardly of said walls and to bear upon the walls of the elevator shaft, and, during the movements of the elevator to engage lugs 21 of the disks.

The pivotal mountings 11 of the disks are disposed in vertical alinement. Since the elevator moves vertically, operating-lugs 24 will move in adjacent vertical planes, these planes being coincident, respectively, with the planes in which are disposed lugs 21 of disks; and therefore, in operation, when the elevator moves upward or downward, lugs 24 will slide upon the walls of the shaft, springs 25 being compressed. By the force of their springs these lugs will engage lugs 21 of the disks, and will cause the disks to be partly rotated, the limit of said rotatable movement being in an arc between shoulders or stops 15 and 16 of the disks. After the lug 21 of a disk is engaged by a lug 24 of the moving elevator, said lug 21 will slide during the movement of the disk into one of the cavities 22 or 23, and undue vibration of the disk will be prevented.

At 26 is indicated a chamber for containing fresh or pure air, the supply coming from any suitable source.

At 27 upon the roof of the building is indicated a flue or intake chamber for the elevator shaft, this chamber having a conducting pipe 28 communicating with chamber 26, and provided with a valve 29 which permits a movement of the air into the shaft, but prevents a reverse movement.

A pipe for discharging foul air is indicated at 30. It has a port *d* communicating with the lower end of the shaft, and is provided with valve 31, and through this pipe air may pass outward from the building, a reverse movement being prevented by operation of the valve.

In operation, when the elevator moves upward, the air above the cage will be forced from the shaft through passageways 6, and since lugs 24 will engage cavities 23, the disks will be rotated in a manner to cause their apertures 12 to register with passageways 5, said disks causing the closure of passageways 6; and by reason of suction during this movement of the elevator, air will be drawn from the rooms into the shaft through passageways 5 at all points below the moving cage. Each ascent of the elevator therefore causes a movement of the air above it to pass into the rooms through passageways 6, and causes foul air to be drawn into the shaft at points below it; and automatically closes passageways 6, so that, during a descending movement, the foul air may not move from the shaft into the rooms. When the elevator moves downward, all of the passageways 6 below the cage having been closed by the disks as above described, the foul air will not enter the rooms therethrough, but will be forced downwardly and will be discharged through pipe 30. During this descending movement, lugs 24 of the elevator will engage within cavities 22 and will cause a part rotation of the disks, apertures 13 of said disks registering with passageways 6. Also, as is obvious, during the descending movement of the elevator, air will be drawn into the upper part of the shaft through the port *a* of chamber 27, the supply coming from chamber 26, through pipe 28. It will thus be seen that a control is made so that, by the movements of elevators, fresh air may be supplied to the rooms of a building, and foul air may be withdrawn therefrom, and the air thus supplied may, of course, be heated air or that which has been refrigerated. Only a slight force is required, and since the operation is automatic, the practice of the improvement, as described, is comparatively inexpensive.

As shown in Fig. 1, pipes 6 may be formed to advantage with discharge terminals or branches *b* and *c*, to cause a more uniform distribution or circulation of air in the rooms.

It will be understood that the ports *a* and *d* at the terminals of the shaft operate, respectively, as intake and discharge ports for said shaft, and that the air-passageways 5 and 6 which form the communications between the shaft and each of the rooms operate, respectively, as intake air-passageways and exit air-passageways for the shaft.

While the upright shaft must be tubular and substantially air-tight in order that the cage to be reciprocated therein may cause a movement of the air in advance and rearwardly of the moving cage, this construction will not prevent the provision and use of doors 8, and the doors may be opened and closed during operation since rollers 20 and the ends of the cage make, substantially, a closure of the transverse area of the shaft, both below and above the cage, at the time the doors are ordinarily opened and closed.

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

1. A ventilating system for the rooms of a building, comprising, in combination with an upright tubular shaft having at one of its terminals an intake port with a valve, its opposite end having a discharge port with a valve, said shaft being provided between said ports to communicate with each room

with an exit air-passageway and an intake air-passageway; an elevator disposed for longitudinal reciprocation within and provided with layers at its ends for obstructing the transverse area of said shaft; rollers adapted to bear upon the walls of the shaft while mounted upon the ends of the elevator; coöperating means upon said shaft and elevator whereby the upward movement of the elevator will cause a movement of air from that part of the shaft above the elevator through said exit air-passageways, the air moving through said intake air-passageways into that part of the shaft below the elevator.

2. A ventilating system for the rooms of a building, comprising, in combination with an upright tubular shaft having at one of its terminals an intake port with a valve, its opposite terminal having a discharge port with a valve, said shaft being provided between said terminal ports to communicate with each room with an exit air-passageway and an intake air-passageway; an elevator disposed for longitudinal reciprocation within and provided with layers at its ends for obstructing the transverse area of said shaft; rollers adapted to bear upon the walls of the shaft while mounted upon the ends of the elevator; coöperating means upon said shaft and elevator whereby the upward movement of the elevator will cause a movement of air from that part of the shaft above the elevator through said exit air-passageways, the air moving through said intake air-passageways into that part of the shaft below the elevator, the downward movement of the elevator causing a movement through said terminal discharge port of air within the shaft below the elevator, the air moving into the shaft above the elevator through said terminal intake port.

3. A ventilating system for the rooms of buildings, comprising, in combination with an upright tubular shaft having terminal intake and discharge ports with valves, said shaft being provided between said terminal ports to communicate with each room with an exit air-passageway and an intake air-passageway; an elevator disposed for longitudinal reciprocation within and having its ends provided with imporforate layers; coöperating means upon said shaft and elevator whereby the movement of said elevator in one direction will cause a movement of air from that part of the shaft in advance of the elevator through said exit air-passageways, the air moving through said intake air-passageways into that part of the shaft rearwardly of said elevator.

4. A ventilating system for a building having a plurality of rooms, comprising, in combination with an upright shaft having terminal intake and discharge ports with valves, said shaft being provided between said terminal ports to communicate with each room with an exit air-passageway and an intake air-passageway; an elevator disposed for longitudinal reciprocation within and having its ends provided with imperforate layers; coöperating means upon said shaft and elevator whereby the movement of said elevator in one direction will cause a movement of air from that part of the shaft in advance of the elevator through said exit air-passageways, the air moving through said intake air-passageways into that part of the shaft rearwardly of said elevator, the movement of the elevator in the opposite direction causing a movement of air from the shaft through a terminal discharge port, and a movement of air within the shaft through a terminal intake port.

5. A ventilating system for the rooms of a building, comprising, in combination with a tubular shaft having terminal ports with valves, and having between said terminal ports in communication with each of said rooms exit air-passageways and intake air-passageways; an elevator disposed within the shaft for movements longitudinally thereof and provided with imperforate ends; devices supported by the walls of the shaft and operated by the movements of the elevator whereby during a movement of the elevator in one direction air may be moved from one part of the shaft through the exit air-passageways, air moving into another part of the shaft through the intake air-passageways.

In testimony whereof I have affixed my signature in presence of two witnesses.

AUGUST M. BERGLUND.

Witnesses:
HIRAM A. STURGES,
A. F. CLARK.