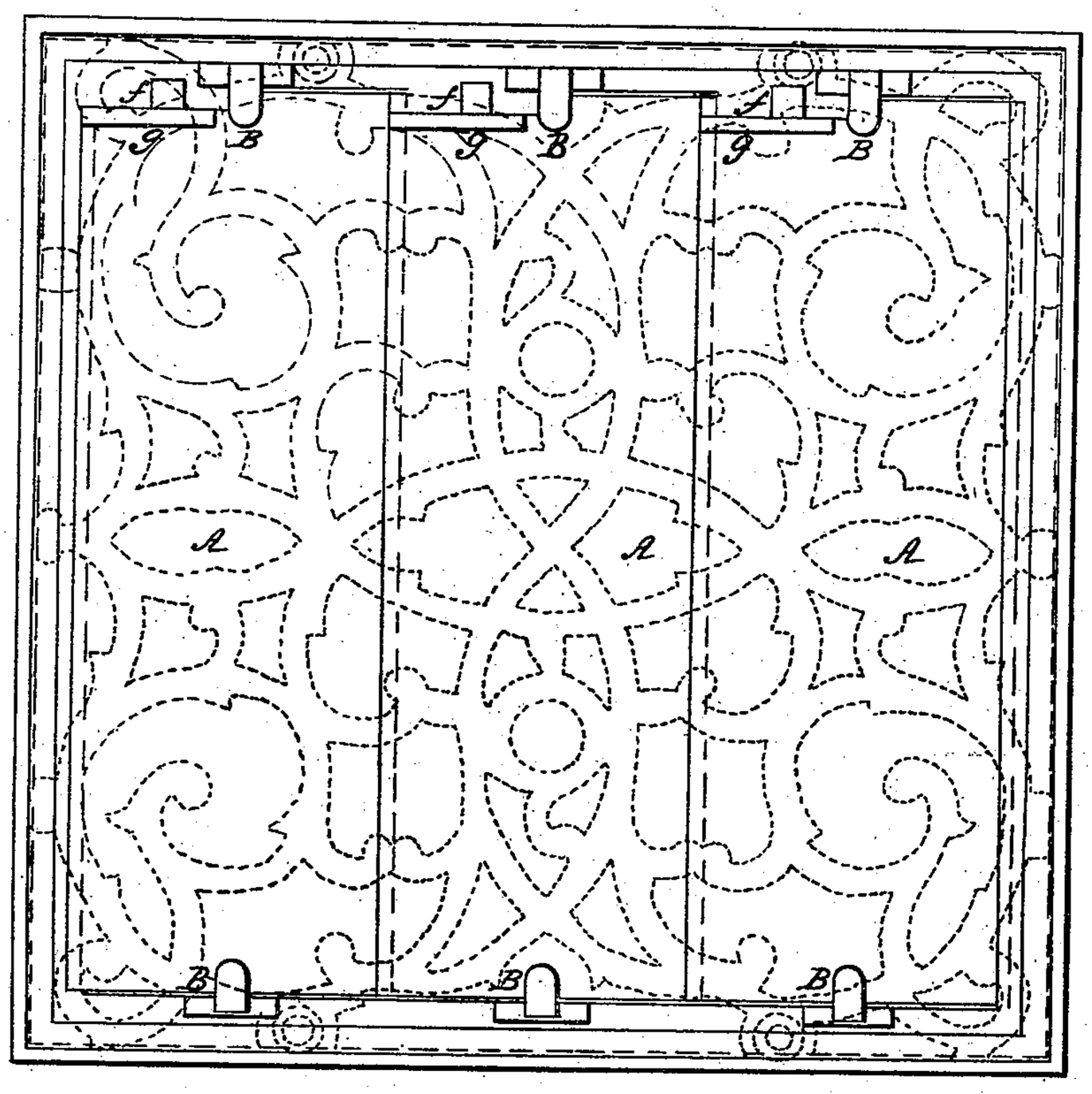
2 Sheets—Sheet 1.

W. TURTON.

Hot Air Register.

No. 40,294. Patented Oct. 13, 1863.

Fig. 1.



Witnesses:

Stephen K. Young

George H. Bennett

Inventor:

William Turton

2 Sheets—Sheet 2.

W. TURTON.

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Fig. 2.

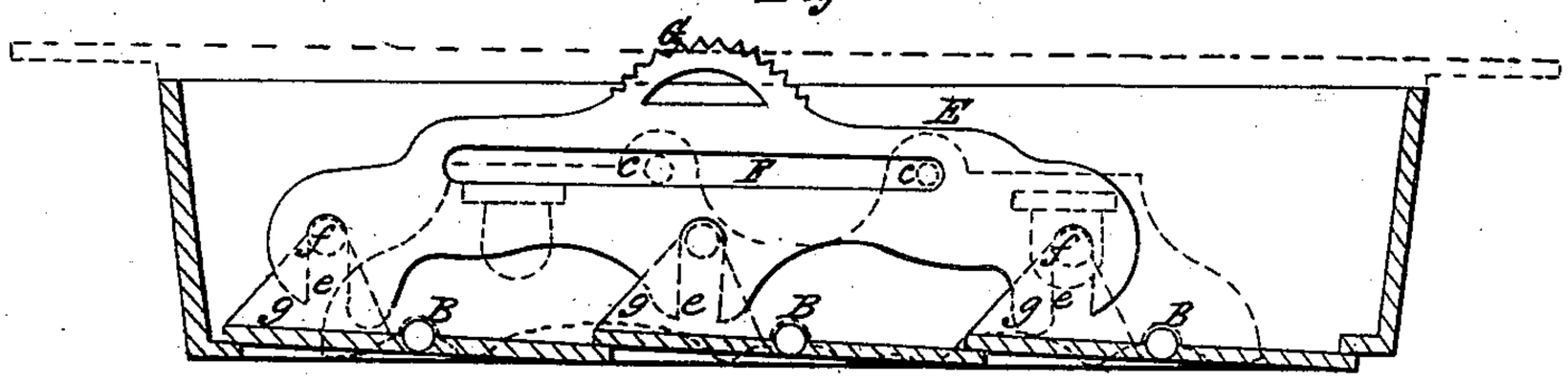


Fig. 3.

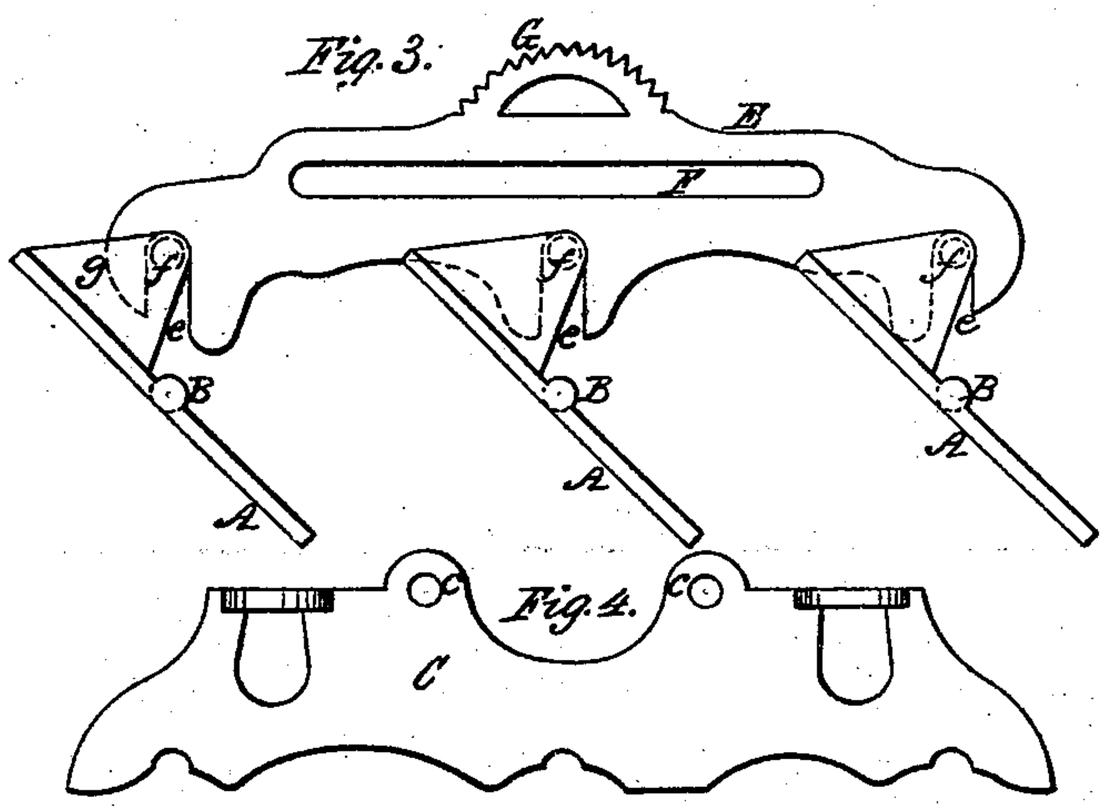
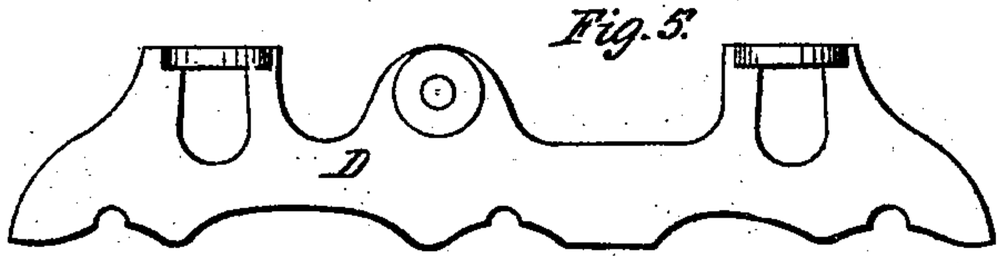


Fig. 4.

Fig. 5.



Witnesses:
Stephen H. Young
George B. Bennett

Inventor:
William Turton

UNITED STATES PATENT OFFICE.

WILLIAM TURTON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN HOT-AIR REGISTERS.

Specification forming part of Letters Patent No. **40,294**, dated October 13, 1863.

To all whom it may concern:

Be it known that I, WILLIAM TURTON, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Hot-Air Registers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a plan view; Fig. 2, a vertical section of the register, showing the slotted parallel rack inside. Fig. 3 is a side elevation of the slotted parallel rack and the leaves of the register. Fig. 4 is the end piece that is secured to the side of the register behind the rack, Fig. 3. Fig. 5 is the end piece which receives the opposite ends of the leaves of the register.

Similar letters refer to like parts on all the figures.

My invention is an improvement in operating register-fans, wherein I use my principle of the rack and pinion, which was patented by me March 16, 1852; but instead of forming the bearings for the rack, which gives the vibrating or opening-and-closing movement to the register-fans, upon these fans, I employ independent bearings or supports for the rack, and allow the pivotal connections of the fans with the rack to play up and down and shift their positions in the slotted guides or teeth of the rack, while this rack is supported squarely and receives a rectilinear motion which is independent of that which it gives the fans, all as will be hereinafter described.

I will describe my invention so as to enable any person skilled in the art to make and use the same.

The register is made of metal with four sides, like a box. It is open at the bottom and at the top, but the latter is usually covered with open ornamental metal-work, as represented by the red lines in Fig. 1. Hot-air registers are usually set in floors to permit hot air to pass up from a heater placed in an under apartment for the purpose of warming an upper room or apartment. They are also set in side walls and used as ventilators for the escape of vitiated air, and they are also suitable for the dampers of heaters. There are three fans or leaves, A A A, (shown in Fig. 3 and in the plan view, Fig. 1, as belonging to this register,) but any number may be employed. These fans are suspended by journals B B B in the end pieces, Figs. 4 and 5. These end pieces, C D, are thin castings of metal, and are secured in the two inside sides of the register opposite one another, as shown in Fig. 1. The end piece, C, is secured behind the rack, as shown by the red lines, Fig. 2, and the one, D, is placed on the opposite side. The one, C, has two guide-pins, *c c*, cast upon it.

E is the slotted rack. It is shown most clearly in Figs. 2 and 3. This rack is a plate of cast metal, with three elongated vertical slots, *e e e*, in it, and a long horizontal slot, F, and a crown-spur, G. At one end of each fan is the section *g* of a pinion, projecting upward, and on it is one tooth, *f*. It resembles the section of a "bull-wheel" with one tooth, as shown in Fig. 1. Each fan is perfectly balanced. The slotted rack E is secured on the interior side of the register, with the two guide-pins, *c c*, inserted in its horizontal slot F, and each separate vertical slot *e e e* embraces a tooth, *f*, of the fans of the register, as shown in Figs. 2 and 3. The slots of the rack E are of sufficient depth to permit the tooth-pins *f* of the fans to assume their different positions in moving the fans. In practice, the lower forked ends of the rack E will be turned slightly outward toward the side of the register-box, thus spreading this plate out at its bottom that it may touch the outside side of the portions *g g*. This will keep the plate E in its place against the end piece, C, and prevent it from casually falling out, although the top-plate of the register be removed. As the register is set in the floor, the fans are adjusted to any angle—such as one of forty-five degrees, as shown in Fig. 3—which permits the fullest extent of opening for the hot air to pass between the fans, or they may be farther contracted to any degree, and also completely closed, as shown in Fig. 2, by simply placing the foot upon the crown-spur G and pushing the rack back and forth. The rack is guided by the pins *c c c*, and always moves in a straight line. It may also be applied to circular registers by being formed to suit the curve of the registers, and it can also be so arranged as to be applied at the middle, instead of the end, of a register, a damper, or ventilator, and may be operated by a cord attached to the crown-spur G.

The simplicity of the devices, and the complete and easy control which the slotted rack has over the fans of the register, render the improvement very advantageous to manufacturers of such apparatus.

The advantages of supporting the rack-plate E on guides which are independent of fans or damper-plates are that the fans, or the projecting attachments thereon, are liable to be broken or deranged by persons stepping on the crown-spur G, or by the rolling of a heavy load over or on this spur, which it will be readily seen would not be the case if the rack E was pivoted to or connected in any other manner with the fans. Then again, by my arrangement of the rack E in its supports, the crown-wheel G′ cannot rise and fall in opening and closing the damper-plates, as hitherto, but it moves in a plane parallel with the surface of the damper-box, and thus it can be operated by the foot in a very efficient manner and with great ease. It will also be seen that I obtain by my arrangement of the rack a very free and easy motion of the damper-plates, as there is very little friction upon the pins *f f* or the stud-bearings of the dampers; and then again, there is no lifting motion of the rack required in order to open or close the damper-plates. This feature alone makes my invention a decided improvement over registers wherein the rack or other device is pivoted or otherwise connected to the fans and rises and falls in opening or closing the fans. In such arrangements the pressure of the foot (in floor-registers) upon the crown-spur G only adds so much friction on the pivot-connections and makes the fans very hard to operate, not only from this cause alone, but also from the fact that the rack must be raised by the foot at the same time that it is pressed forward. Where the rack or crown-spur G has its bearings upon the damper-plates there is always a liability of casually closing these plates should they be open, or vice versa, by persons walking over the register; but in my improvement, where the rack has its supports independently of the damper-fans, the pressure which may be put upon the crown-spur of this rack will be all received by the guide-pins *c c*, which support the rack-plate, as shown in Figs. 2 and 4 in red lines, and not upon the fans.

I do not wish to be understood as stating that I am the first one who relieved the fans or blades from the weight employed to operate them, for it is well known that a slotted rack with traveling studs of fans or blades geared to it has been contrived, but such contrivance has never been introduced into the trade for the reason, I suppose, that the rack had its slots closed by a bar, and that said bar had to slide on a base support or guide of the register-box, such plan of construction inducing too great friction and requiring much labor and care in fitting and repairing the register, and also being liable to clog with dirt and not operate practically.

What I claim as my invention, and desire to secure by Letters Patent, is—

Suspending the slotted rack E, constructed with open slots and connected with fans A, which have traveling studs or teeth *f f*, by means of firm supports arranged above the base of the rack and on both sides of the actuating part G, so that the base of the rack has no frictional contact with the register-box, substantially as set forth.

WILLIAM TURTON.

Witnesses:
STEPHEN R. GOING,
GEORGE H. BENNETT.