No. 668,400. Patented Feb. 19, 1901.

# T. C. BELDING & C. H. SCHLABACH.

## HOT AIR AND VENTILATING REGISTER.

(No Model.) (Application filed Nov. 6, 1899.)

2 Sheets—Sheet 1.

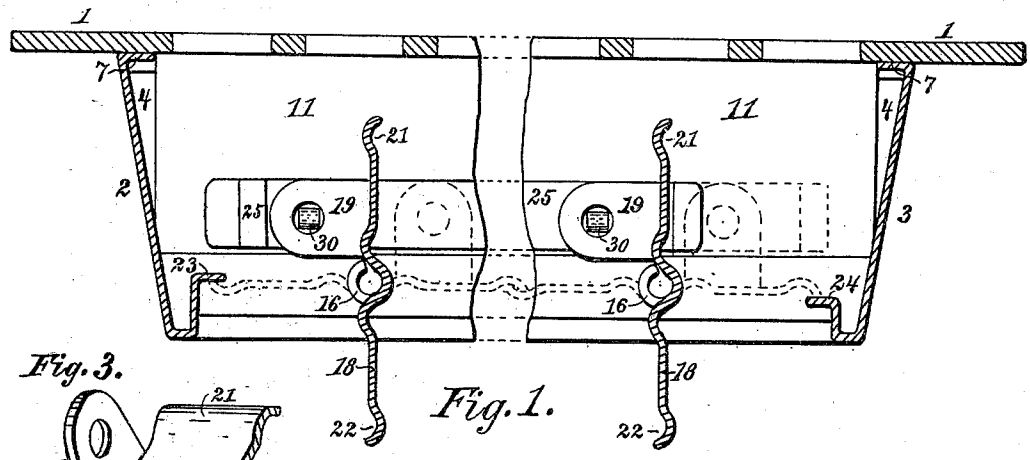



Fig. 1.

Fig. 3.

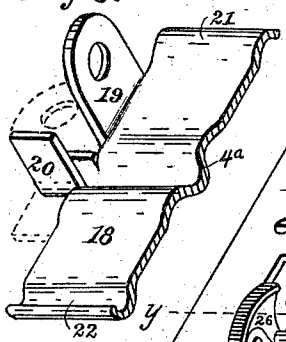






Fig. 2.

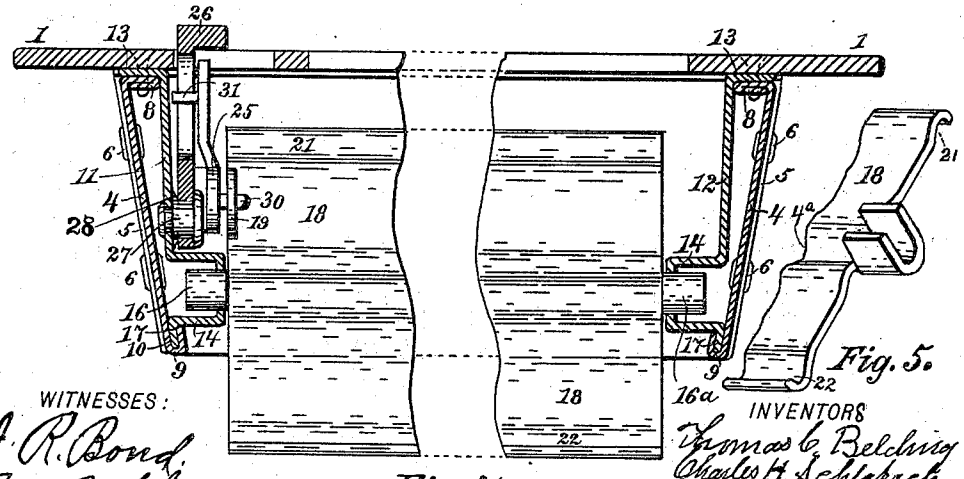



Fig. 5.

Fig. 4.

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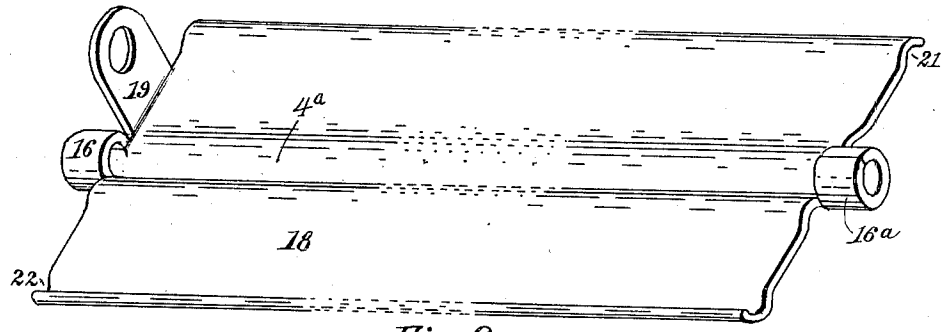



Fig. 6.

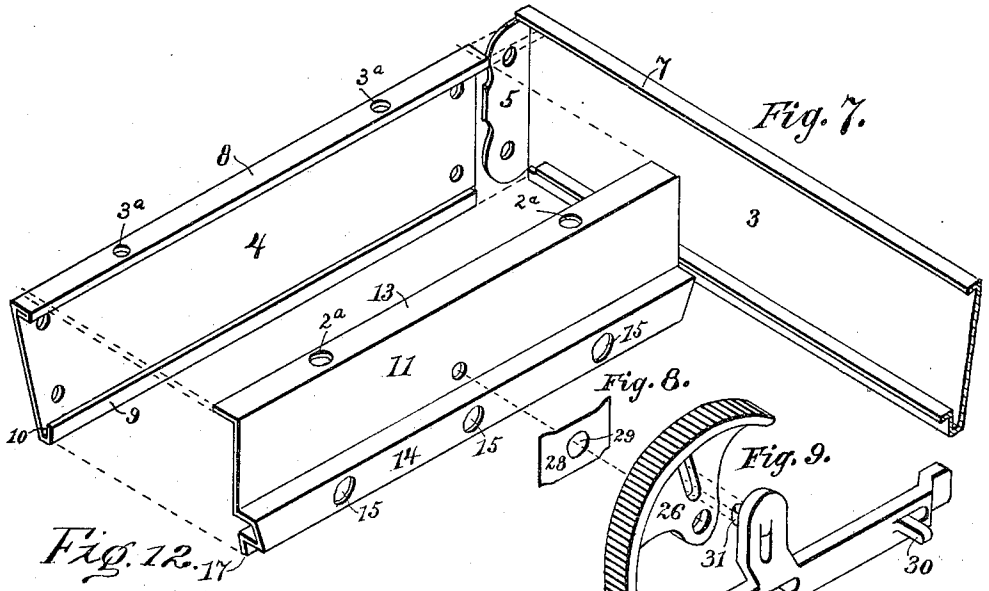



Fig. 7.

Fig. 8.







Fig. 9.

Fig. 10.

Fig. 12.

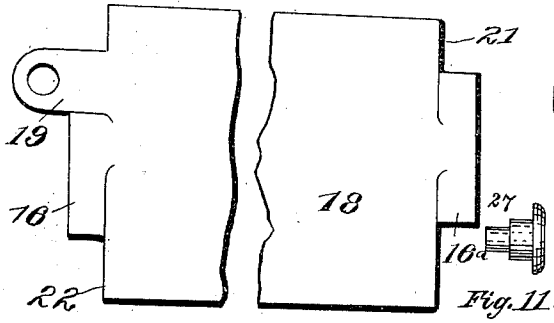



Fig. 11.

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# UNITED STATES PATENT OFFICE.

THOMAS C. BELDING AND CHARLES H. SCHLABACH, OF CANTON, OHIO, ASSIGNORS TO THE CANTON STEEL ROOFING COMPANY, OF SAME PLACE.

## HOT-AIR AND VENTILATING REGISTER.

SPECIFICATION forming part of Letters Patent No. 668,400, dated February 19, 1901.

Application filed November 6, 1899. Serial No. 735,913. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS C. BELDING and CHARLES H. SCHLABACH, citizens of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Hot-Air and Ventilating Registers; and we 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, and to the figures of reference marked thereon, in which—

Figure 1 is a cross-section through line *x x*, Fig. 2. Fig. 2 is a perspective view showing the different parts properly assembled. Fig. 3 is a view showing a portion of one of the blades or valves and illustrating the trunnion partially finished. Fig. 4 is a longitudinal section on line *y y*, Fig. 2. Fig. 5 is a view showing a portion of one of the blades or valves and illustrating the opposite end from that shown in Fig. 3, also showing the trunnion partially formed. Fig. 6 is a detached view of one of the blades or valves. Fig. 7 is a view showing one of the end members and side members, also showing the parts belonging thereto detached and the members detached. Fig. 8 is a detached view of the tension-spring. Fig. 9 is a detached view of the blade or valve operating segment. Fig. 10 is a detached view of the blade or valve operating bar. Fig. 11 is a detached view of the bolt for connecting the segment, which segment operates the blades or valves. Fig. 12 is a view of the fan-blank cut, but not bent.

The present invention has relation to hot-air and ventilating registers; and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, 1 represents the register face or plate, which is formed of a size to correspond with the size of the register-box, reference being had to the ordinary overlapping flanges or portions, which of course rest upon the floor or other structure to which the register proper is to be attached or connected. The register-plate is of course formed with openings, which openings may be of any desired design, reference being had to allowing the heated or other air to freely escape through said plate.

The register box or frame proper consists of the side members 2 and 3 and the end members 4, which when connected together produce a rectangular frame. The side members 2 and 3 are each provided with the end flanges 5, which flanges are for the purpose of providing means for connecting the end members 4 with the side members 2 and 3; but it will be understood that flanges, such as 5, may be formed upon the end members 4, and thereby accomplish the same object, it of course being understood that if in the event flanges, such as 5, are formed upon the end members no flanges are to be formed upon the side members 2 and 3.

For the purpose of securely connecting the side members and end members together rivets or their equivalents 6 are to be employed.

Each of the side members 2 and 3 are provided with the projecting flanges 7, which flanges are for the purpose of adding strength and rigidity to the upper part of said side members and also form a rest for the register-plate 1.

The end members 4 are substantially of the form shown in the drawings, and, as shown, their top or upper edges are provided with the flanges 8, which flanges are formed by first folding a portion of the end members over and upon itself and then folding the double portion at an angle to the end members. The lower edge of the end members 4 are provided with the U-shaped portions 9, which U-shaped portions are formed by bending the lower portions of the end members as illustrated in Fig. 4, thereby forming grooves 10 for the purpose hereinafter described.

The blade or valve carriers 11 and 12 are located upon the inner faces of the end members 4, their upper edges being provided with the flanges 13, which flanges are for the purpose of overlapping the flanges 8, formed upon the end members 4. The lower portions of the blade or valve carriers 11 and 12

are provided with the ribs 14, which ribs are provided with the apertures 15, said apertures being for the purpose of receiving the trunnions 16 and 16ª.

Below the ribs 14 are located or formed the flanges 17, said flanges being for the purpose of holding the bottom or lower portions of the blade or valve carriers in a fixed position by seating the flanges 17 into the grooves or recesses 10.

The blades or valves 18 are formed of a length to correspond with the distance between the ribs formed in the carriers 11 and 12 and provided with the trunnions 16 and 16ª, which trunnions are formed by cutting the ends of the blade or valves 18 and then bending or rolling the cut portion, so as to form trunnions, such as 16 and 16ª.

For the purpose of providing an arm to operate the blades or valves 18 a portion of the metal is cut to form said arms and then bent at an angle, thereby forming the arm 19.

The trunnion 16 is preferably formed by cutting loose the portion 20 from one side of the center of the blade or valve 18, as shown in Fig. 3, and then rolling or forming said cut portion into the position shown in Fig. 6, by which arrangement the arm 19 is brought closest possible to the trunnion 16.

It will be understood that the center grooving, fluting, or corrugations 4ª, formed in the blades or valves 18, may be varied without departing from the nature of our invention.

The blades or valves 18 are provided upon their longitudinal edges with the crimps, grooves, or curved flanges 21 and 22, which grooves, crimps, or flanges are for the purpose of adding strength to the blades or valves.

In adjusting the valves or blades 18 they are so located and arranged that the grooves, crimps, or flanges 21 and 22 will overlap each other, as illustrated in the dotted lines, Fig. 1, and when said blades or valves are brought into the position illustrated in the dotted lines the register proper is closed or cut off.

It will be understood that the grooves, crimps, or flanges 21 and 22 are to be formed in opposite directions upon opposite longitudinal edges, allowing the edges of the blades or valves to overlap each other, thus preventing the passage of air and dust between the blades or valves when the register proper is closed.

It will be understood that in the arranging of the blades or valves, and inasmuch as all of the blades or valves must move in unison, the outer edges of the outer valves will come upon opposite sides of the flanges 23 and 24, formed upon the side members 2 and 3, and for the purpose of preventing the passage of air and dust the flange 23 should be located somewhat higher than the flange 24, inasmuch as the outer edge of one of the outer blades or valves must come under or engage the flange 23 and the outer edge of the outer blade or valve must come on top or engage the flange 24.

For the purpose of operating the blades or valves 18 the connecting-bar 25 is provided, which connecting-bar is pivotally connected to the arms 19 and to the operating-segment 26, said operating-segment being pivotally connected to the blade or valve carrier 11 by means of the rivet 27 or its equivalent.

It will be understood that when the operating-segment 26 is turned in one direction it will open the blades or valves 18 and when turned in the opposite direction it will close the blades or valves, said blades or valves being opened and closed by the intermediate connection between the segment for said blade or valve.

For the purpose of providing proper tension to the operating-segment 26 the spring 28 is provided, which spring is located between the carrier 11 and the inner face of the operating-segment 26 and is held in place by means of the rivet 27, which passes through the aperture 29, formed in said spring.

For the purpose of providing proper pivotal connection between the operating-segment 26 and the blades or valves 18 the operating-bar 25 is provided with the pintles 30 and 31, which pintles may be struck from the operating-bar 25, as illustrated in Fig. 10. It will, however, be understood that said pintles may be formed in any well-known manner, inasmuch as our only object is to provide the pivotal connection between the operating-segment and the blades or valves 18.

The box or frame proper is connected to the register-face 1 by means of the screws 32, and for the purpose of providing a sufficient amount of metal for holding the screws the flanges 8 are formed of two thicknesses of metal, thereby producing sufficient thickness of metal to form screw-threaded apertures of sufficient strength to securely hold the register-frame to the face 1.

It will be understood that by locating the blade or valve carrier 11 and 12 as illustrated in the drawings the top flanges 7 of side members 2 and 3 and top of flanges 13 of blade or valve carriers will form a level seat for face 1 when the register is assembled.

Another object in constructing the blade or valve carriers as shown is that they admit of the most rapid and easiest assembling of the parts 11, 12, 18, and 25. As the blades or valves are placed in proper position, the connecting-bar is placed in its proper relation to engage the arms 19, the trunnions are inserted in holes 15, and all of the above parts as described lowered into the box or frame.

The face 1 is placed on top of box, and screws 32 are inserted in holes in face 1 through holes 2ª in parts 11 and 12 and into threaded apertures 3ª in end members 4.

All of the different members of which this register is formed except the rivets, screws, and operating-segment are constructed from sheet metal by blanking, punching, and forming the parts into proper shapes by suitable means, producing registers of great dura-

bility, of lightest weight, and lowest cost, and the breakage in shipping and freight-charges are reduced to a minimum.

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

1. In a hot-air and ventilating register, the combination of the register-plate 1 having connected thereto the box or frame consisting of the members 2, 3 and 4, said members connected together, the members 4 provided at their top or upper edges with double-folded flanges and their lower edges provided with the U-shaped portion 9, carriers 11 and 12 provided with ribs 14 and flanges 17, blades or valves provided with trunnions and means for operating the blades or valves, substantially as and for the purpose specified.

2. The combination of a register-plate, members 2, 3 and 4, the members 2 and 3 provided with angular flanges 5 and the flanges 7 located at their upper edges, the members 4 having their ends located under the flanges 7, the carriers 11 and 12 provided with flanges 13 located over flanges 8, and said flanges located between the flanges 7 and means for fastening the lower edges of the parts 4 and 11, substantially as and for the purpose specified.

3. The combination of the end members 4 provided with the flanges 8 formed of a double thickness of metal and the flanges located at an angle to said end members, the blade or valve carriers 11 and 12 provided with flanges 13 and the flanges 13 located over the double-folded flanges 8, and a register-plate and means for connecting the register-plate to the rectangular frame and means for connecting the parts 4 and 11 together, substantially as and for the purpose specified.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

THOMAS C. BELDING.
CHARLES H. SCHLABACH.

Witnesses:
J. A. JEFFERS,
F. W. BOND.