(No Model.)

F. M. STEVENS.

HOT AIR AND VENTILATING REGISTER.

No. 386,223. Patented July 17, 1888.

Fig. 1.

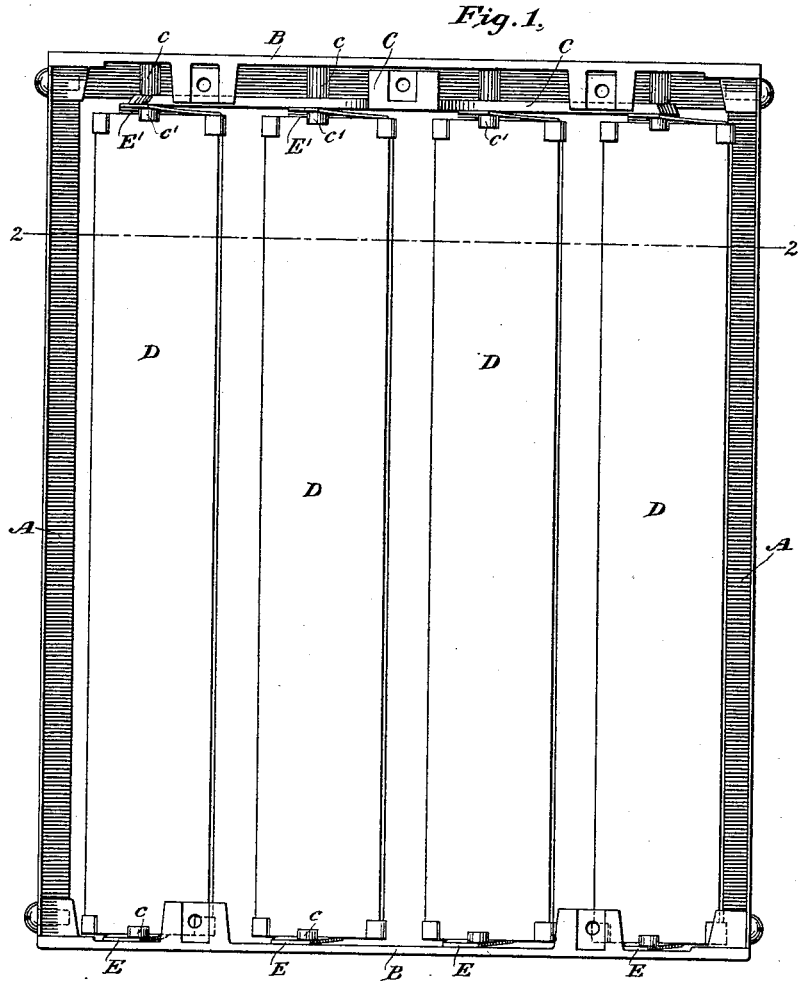


Fig. 3.

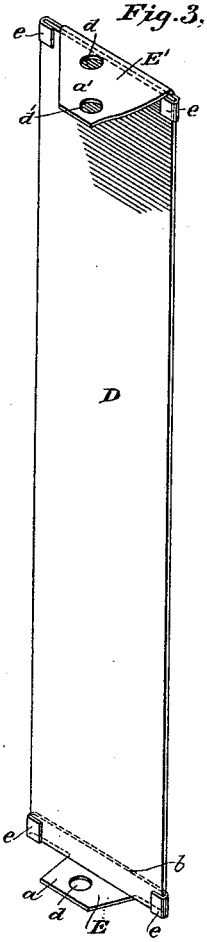


Fig. 2.

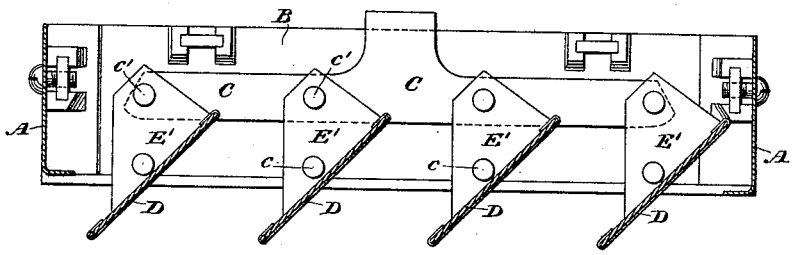


Fig. 4.

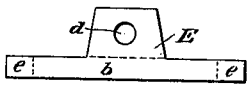
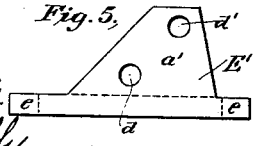


Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK M. STEVENS, OF BROOKLYN, NEW YORK.

HOT-AIR AND VENTILATING REGISTER.

SPECIFICATION forming part of Letters Patent No. 386,223, dated July 17, 1888.

Application filed July 25, 1887. Serial No. 245,239. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK M. STEVENS, of Brooklyn, New York, have invented certain new and useful Improvements in Hot-Air and Ventilating Registers; and I do hereby declare the following to be a full, clear, and exact description of my invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the use of sheet-iron or other sheet metals for the fans or valves of register-frames. In the hot-air and ventilating registers in common use the fans are made of cast-iron, which is relatively expensive. Moreover, it is a well-known fact that cast-iron fans are so easily broken that their breakage in transportation and fitting alone adds a large percentage to the original cost.

I am aware that an attempt has been made heretofore to use sheet metal for register-fans; but the entire absence from the market of any register embodying this improvement shows that the method of using the sheet metal has been open to practical objections. Sheet-metal fans have been made having each end turned up at right angles, so as to form a lip, and with the lips punched with holes, so that the fan may revolve on pivots cast on the end pieces and on the connection. In practice, however, it is found that sheet metal thick enough to be stiff will break when bent at the end. To obviate this difficulty, thin sheet metal has been employed, which is fluted and hemmed or wired at the edges to stiffen it. The latter operations increase the trouble and expense so much that all advantage of the cheaper material is lost. By my invention I make a register having sheet-metal fans, which register obviates the foregoing objections and is cheaper and better than any register now in use.

In order to explain my invention I make the following detailed description, reference being had to the accompanying drawings, which are hereby made a part of this specification.

In the drawings similar letters refer to similar parts.

Figure 1 is a front elevation of a register-frame, showing fans in position. A is the side. B is the end piece. C is the connection. *c c'* are pivots cast on the frame and connection. Fig. 2 is a cross-section of the register-frame through 2 2 in Fig. 1. Fig. 3 represents a detached fan. Figs. 4 and 5 show the blanks E and E' before bending.

In its preferred form the fan which I employ is composed of three parts. I take a rectangular sheet-metal blank, D, of length and width proper for a fan and thick enough to be stiff without fluting or hemming. In practice I find one sixteenth of an inch to be about the best thickness. Then I take two sheet-metal blanks, E E', whose general configuration conforms to that shown in Figs. 4 and 5, and which are thin enough to bend without danger of breaking. In practice I find that about one sixty-fourth of an inch is the best thickness for these blanks.

The blank E is composed of two principal portions, *a* and *b*, divided in the figure by the dotted line. The portion *a*, which I designate a lip, is intended to be turned up. Through *a*, I punch the hole *d*, intended to receive the pivot *c*. The lip *a* must be of such size as to allow metal enough to give strength around the hole *d*. The portion *b* may be of any desired width, and must be longer than the width of the blank D, so that when it is applied to the surface of the blank D at one end of D the tips *e e* may be bent over and clinched on the other side of D. The hole *d* is so located that when the blank E is in place about the blank D the hole *d* will be midway between the side edges of blank D.

The foregoing description of the blank E will answer in most respects for the blank E'. The lip *a'* has two holes, *d d'*, punched in it, and must be so large as to allow metal enough to give strength around both holes. The hole *d* in blank E' is the same in size, position, and function as hole *d* in blank E. The hole *d'* in blank E' is intended to receive the pivot on the connection, by means of which motion is imparted by the connection to the fan, and is situated above the hole *d* and at an angle of about forty-five degrees to the hole *d*, so as to make the rise and fall of the connection necessary in moving the fans as little as possible.

Now, take the blanks D and E and apply the blank E to either surface of D at one end of D, so that the end edge of D will take the position of the dotted line, Fig. 4. Then

bend the lip *a* rigidly up against the edge of the blank D, so that the lip shall form with the blank an angle slightly greater than a right angle. At the same time bend the tips *e e* over the edges of the blank D and press them down firmly. The blank E′ is attached to blank D in the same manner. The frame and the means of moving the fans may be of any desired style, except that at proper intervals on the ends of the frame and on the connection pivots *c c′* are cast for the fans to swing on. When the fan is hung on the pivots and the parts of the frame are all put together, the lips *a a′* will spring out and press slightly against the end B on the one hand and the connection C on the other hand, and will thus give the friction requisite to keep the fans in any position in which they may be turned. I consider this use of the lips *a a′* to be one of the most important parts of my invention. In every hot-air or ventilating register some device requiring one or more additional pieces of metal is necessary to keep the fans in position at any desired angle. I accomplish the same result without any separate means.

By making my fans in three pieces I can use different thicknesses of sheet metal for the different parts. I thus obtain a strong stiff fan without fluting, hemming, or wiring, while the ends bend without danger of breaking.

The blanks E E′, instead of being held in position by the tips *e e*, may be soldered or riveted to the blank D. In either of these cases the tips *e e* may be dispensed with. I do not bind myself in the case of the blanks E E′ to the exact configurations shown in the drawings. The portion *b* may be longer or shorter and wider or narrower, and the lips *a a′* may be rectangular or bounded by a regular curve, or they may be quite irregular in shape, provided only that the conditions mentioned in the foregoing description are complied with. The pivots which I use are the same as similar ones heretofore used and described, being of proper size and shape, and being cast on the ends of the frame and on the connection. Any form of face may be employed for the register. The lips *a a′* might be turned up at right angles to blank D, and any other desired device used for holding the fans in position at any angle.

I do not claim, broadly, a register-fan composed of sheet-iron; nor do I claim the pivots *c c′*, cast on the frame and on the connection; nor do I claim the holes *d d′* by themselves; but

What I do claim, and desire to secure by Letters Patent, is—

1. In a fan or valve for hot-air or ventilating registers, the combination, with a sheet-metal blank, D, of proper dimensions for a fan, of the sheet-metal blanks E E′, rigidly attached to the blank D at the ends thereof, said blanks E E′ having the lips *a a′* turned up against the end edges of D, and having the holes *d d′* punched in the lips, all substantially as and for the purposes set forth.

2. In a fan for hot-air or ventilating registers, the combination, with a rectangular sheet-metal blank, D, of proper length and breadth for a fan, and thick, so as to be stiff without fluting or other alteration of form, of thin sheet-metal blanks E E′, having the tips *e e*, bent over the side edges of the blank D, and having the lips *a a′*, said lips being punched with holes *d d′*, and being turned up against the end edges of blank D at or nearly at an angle of ninety degrees, all substantially as and for the purposes set forth.

3. In hot-air or ventilating registers, the combination, with a register-frame, suitable means for moving the fans, and pivots *c c′*, cast on the frame and connection, of the sheet-metal blank D, and rigidly attached to blank D, at the ends thereof, the sheet-metal blanks E E′, having lips *a a′*, said lips being punched with holes *d d′*, and being turned up against the end edges of blank D at an obtuse angle to D, whereby, when the fan is in position the lips *a a′* will spring outward, and pressing against the connection and the frame will move with frictional contact thereon, all substantially as and for the purposes set forth.

4. In hot-air or ventilating registers, the combination, with a register-frame, suitable means for moving the fans, and pivots *c c′*, of the rectangular sheet-metal blank D, of proper length and breadth for a fan, and thick, so as to be stiff without alteration of form, and the thin sheet-metal blanks E E′, having tips *e e*, bent over the side edges of blank D, and having lips *a a′*, punched with holes *d d′*, said lips *a a′* being turned up against the end edges of blank D at an obtuse angle to D, whereby when the fan is in position the lips *a a′* will spring outward, and pressing against the connection and the frame will move with frictional contact thereon, all substantially as and for the purposes set forth.

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