No. 644,106. Patented Feb. 27, 1900.

# I. D. SMEAD.

## APPARATUS FOR HEATING BUILDINGS.

(Application filed Oct. 27, 1899.)

(No Model.)

Fig. 1.

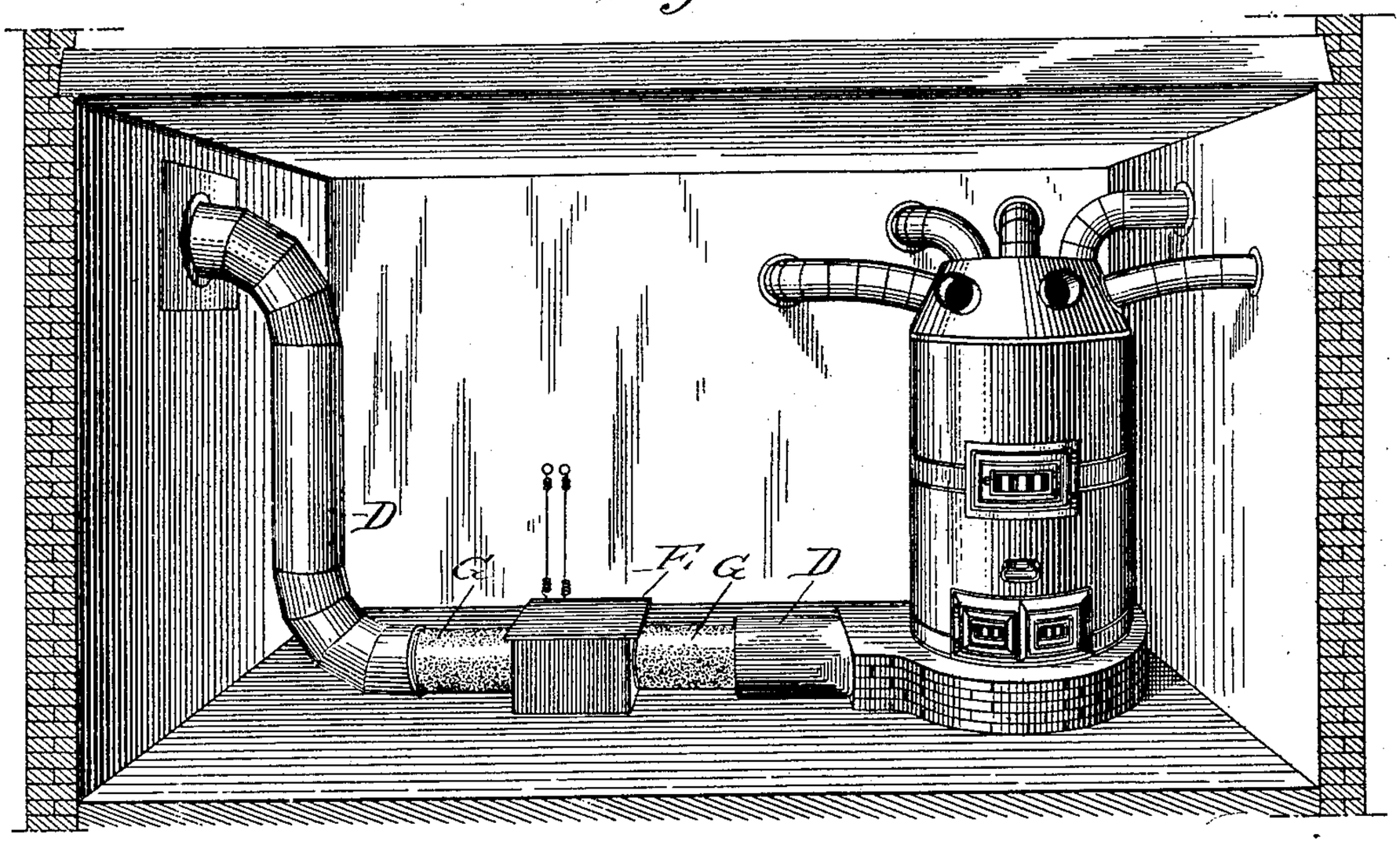



Fig. 2.

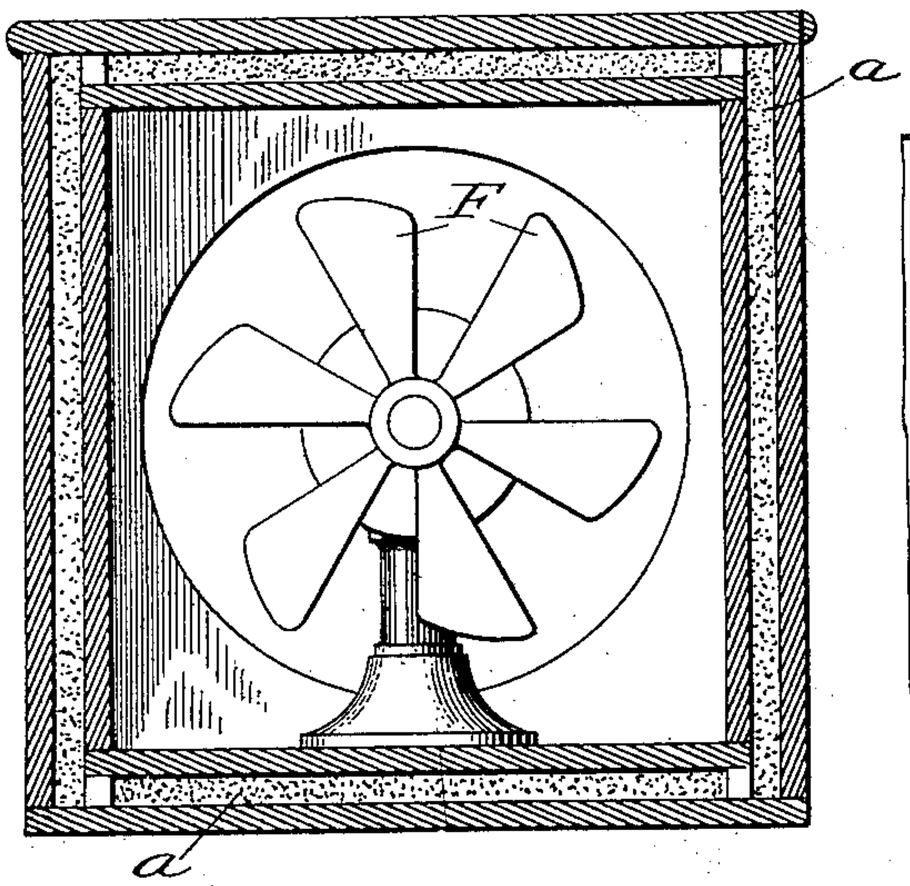
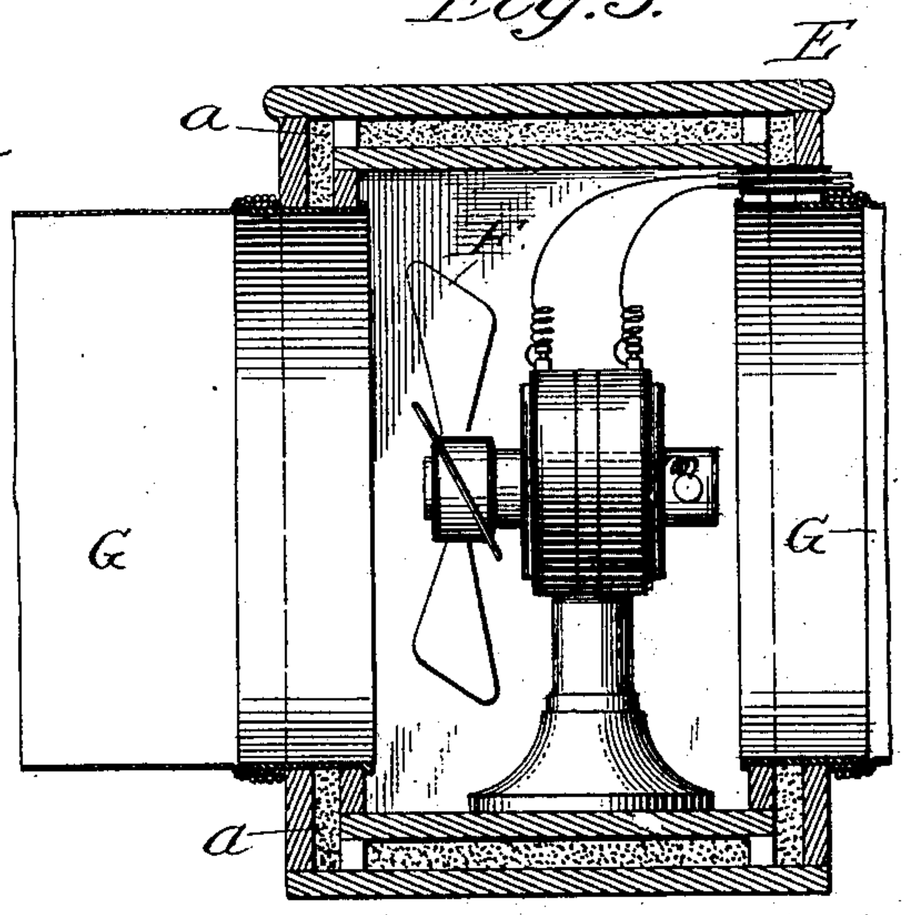



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR HEATING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 644,106, dated February 27, 1900.

Application filed October 27, 1899. Serial No. 734,958. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC D. SMEAD, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Apparatus for Heating Buildings, of which the following is a specification.

My present invention relates to improvements in apparatus for heating buildings; and the invention consists, primarily, in the use of a fan for forcing the supply of air to the heater and in means for eliminating or suppressing the noise created by the fan or blower used to supply air to the furnace or heating apparatus, as hereinafter more fully described.

Figure 1 is a perspective view of the apparatus as arranged in a basement-room. Fig. 2 is a transverse vertical section of the box containing a fan or blower, and Fig. 3 is a similar view taken at right angles to Fig. 2 and showing a portion of the connecting non-resonant air-tube.

In the ordinary method of heating buildings, and especially private dwellings, by means of a hot-air furnace it is well known that on account of the difference in location and length of the various hot-air pipes and their greater or less exposure to the cold and winds they vary greatly in their delivery of the heated air, and that consequently some of the rooms will receive but little heat, while others may be overheated.

The natural law governing the flow of the hot air is that it, like gas or fluids, will take the line of least resistance, and consequently the greatest amount of the heated air will flow through the shortest and most direct pipes or outlets, and hence while some rooms will be well supplied other rooms will get but little or none, actual experiment showing that while one room of a house had its temperature raised to 80° another room in the same house could not have its temperature raised above 54°, both being supplied from the same furnace. To remedy this defect, I adopt what is termed the "plenum" system, which consists in forcing the warm air into the rooms until all are filled, and when those most readily filled are full the air is necessarily forced to flow through the other pipes, and thus supply the other rooms, thereby securing a nearly-uniform temperature in all the rooms. The application of this system requires the use of a fan or blower to force the air to the heater and from thence into the rooms, which idea in and of itself is not new; but a great annoyance is created in the application of a fan for this purpose in private dwellings on account of the noise produced by the fan, it having to be run by means of electricity or a water-motor, as private dwellings are not usually provided with power for such purpose. The electric current is now so generally supplied that it is brought within the reach of nearly all residents in cities and the larger towns, and hence I propose to use that, as a general rule, although it is obvious that any suitable form of motive power may be used. In my experiments in this direction I found that the noise produced by the fan was conveyed by the metallic pipes to the various rooms to such an extent as to render its use impracticable. To remedy this difficulty, I place the fan F within a non-resonant box or case, which, as shown in Figs. 1 and 2, may consist of a double-walled box E, having the space *a* between its walls filled with sand, earth, oats, or any similar substance which is a practical non-conveyer of sound and will serve to suppress or deaden the sound produced by the fan. This non-resonant box or case I connect to the metallic fresh-air pipe D D by a section of canvas pipe G G, as shown in Fig. 1, a section of this canvas pipe being shown enlarged in Fig. 3. If the fan be located, as shown, between the extremities of the fresh-air pipe D, as represented in Fig. 1, a section of canvas tube will be applied at both sides of the fan box or case; but if the fan box or case be located at the inlet end of the fresh-air pipe then it will need to be connected by the canvas tube at that side only where it is connected to the fresh-air pipe which leads to the furnace or heater. By these means I am enabled to use an electric or other fan with success and without annoyance, the noise being no longer conveyed to the rooms.

It is obvious that other means may be used to prevent the transmission of sound through the pipe or air-duct—such, for instance, as connecting the tube to the box or case containing the fan by a joint packed with felt or

any similar non-resonant material, or where a metallic pipe is used, as represented in the drawings, one or more joints of the pipe itself may be provided with such a packing, or where the air around the box or tube is not objectionable and can be used the collar on the box may enter the pipe without contact, or one or more joints of the pipe may be thus arranged, in which case neither the flexible section nor the packing will be required, as the breaking of the continuity of the conducting medium, which in this case is the metal tube or pipe, will prevent the conducting of the sound to the rooms. So, too, where an underground duct is used, as is frequently the case, the walls of which are non-resonant, it is only necessary to place the fan in its non-resonant case and locate the latter so that it will deliver the air into the duct, and hence I do not limit myself to the use of the section of canvas or other non-resonant tubing, but simply show it as one of the best means known to me for the accomplishment of the desired object.

I have spoken of canvas tubing simply because it is the simplest and cheapest; but it is obvious that it may be made of leather, oil-cloth, or any similar material which is practically a non-conductor of sound. So, too, the fan box or case may be made of wood, or of pasteboard, or of any similar material that is a practical non-conductor of sound, the object being to suppress or deaden the sound or noise produced by the fan or blower and prevent its being conveyed to the rooms, as it otherwise would be by the metallic hot-air pipes.

While I prefer to use an electric motor to operate the fan, it is obvious that it may be operated by a small water-motor wherever the building is supplied with water having the necessary pressure or by any other available means. By actual experiment I have found that by these means I am enabled to force the warm air into the various rooms of a building, so as to nearly or quite equalize the temperature in them all without any annoyance or difficulty whatever.

It is obvious that my improvement may be applied equally well with other styles of heaters, such as steam or hot water, and one incidental but great advantage of it is the greater supply of fresh air furnished for the occupants of the rooms.

Having thus fully described my invention, what I claim is—

In combination with a tube or duct for conveying air to a heater, a non-resonant box or case having a fan or blower mounted therein, said box or case being connected to the air tube or duct by a section of canvas or similar non-resonant tubing, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ISAAC D. SMEAD.

Witnesses:

ANTHONY KNEFER,

V. E. NEWCOMB.