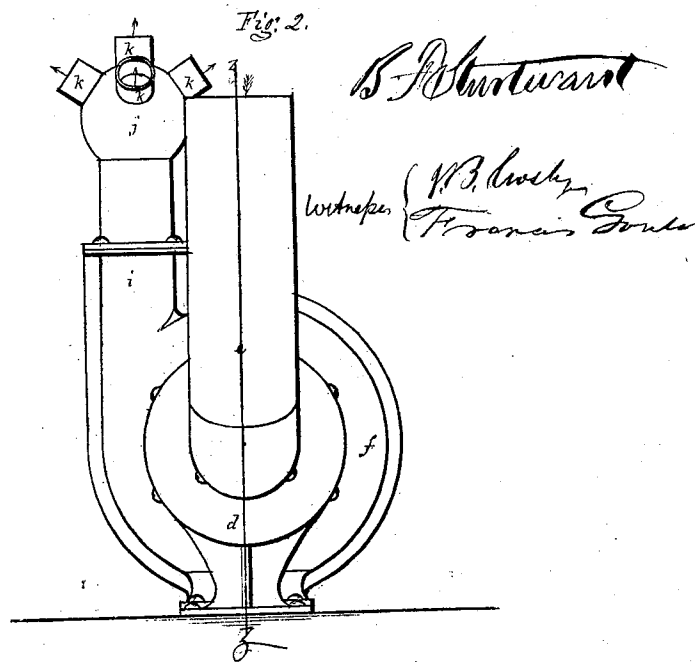
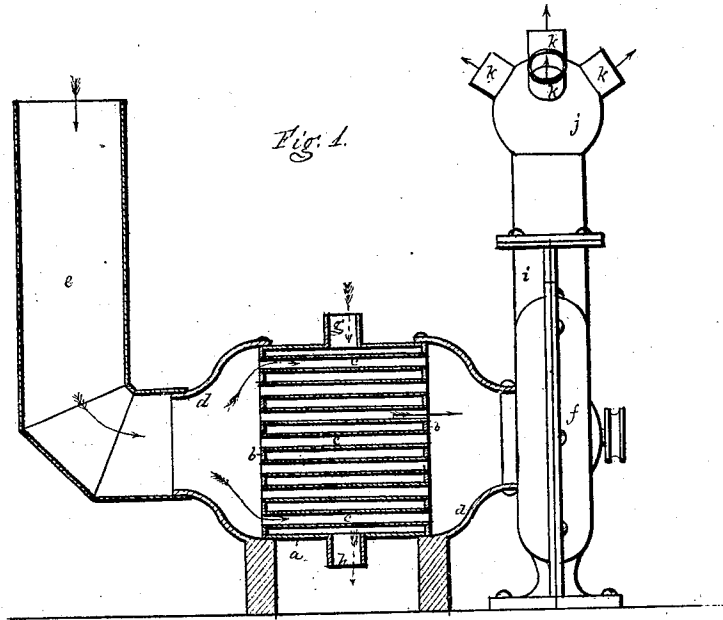


B. F. Sturtevant,

Air Blast.

No. 100,240.

Patented Feb. 22, 1870.



United States Patent Office.

B. F. STURTEVANT, OF JAMAICA PLAIN, MASSACHUSETTS.

Letters Patent No. 100,240, dated February 22, 1870.

IMPROVEMENT IN COMPOUND AIR-HEATERS AND STEAM-CONDENSERS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, B. F. STURTEVANT, of Jamaica Plain, in the county of Norfolk, and State of Massachusetts, have invented an Improvement in Conveying and Distributing Heat Abstracted from Exhaust Steam; and I do hereby declare that the following, taken in connection with the drawings, which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

In many places where steam-engines are employed, especially in manufactories where operatives are crowded in confined rooms, it is preferable to heat and supply fresh air to such rooms, to both heat and ventilate them, rather than to heat again and again the air contained therein, by radiation of heat from pipes or other radiators containing steam, and located within the rooms to be heated.

By my invention the heat contained in exhaust-steam is utilized as well or better than it is by passing through radiators local to the spaces to be heated, with the additional advantages of perfect ventilation and ability to heat any space, without regard to its location.

My invention consists in combining with a rotary blower, having its delivery end provided with two or more distributing-pipes, a heater or cooler made up of series of tubes, which are inclosed in a case having an inlet and an outlet for exhaust steam, the tube sheets or heads of such case being covered by bonnets, which contract from the diameter of the case to the size suited to receive inlet and outlet-pipes for the air, which is drawn through the tubes of the heater and cooler into the blower, from which said air is discharged in a heated condition, by the action of the fan-wheel therein, through the pipes proceeding from the blower outlet.

Figure 1 of the drawings shows in sectional elevation an apparatus embodying my invention, the section being taken in the plane of the line *z z*.

Figure 2, which is an end view of said apparatus.

a is a cylinder, closed at each end by heads *b b* or tube-sheets, in which are inserted open-ended tubes *c*.

The heads *b b* are covered by bonnets or flaring or funnel-shaped pieces *d*, which contract from the diameter of the case or cylinder *a*, to an area about equal to the aggregate area of the internal cross-areas of all the tubes *c*, and to the outer end of one of these bonnets is connected an inlet air-pipe, *e*, while to the

contracted end of the other bonnet the central opening of the blower *f* is joined, or a pipe of any desired length may be inserted between the blower and the contracted end of the outlet bonnet.

At the top of the case *a* is a nozzle, *g*, to which an exhaust steam-pipe is attached, through which steam is made to enter and fill the space in case *a*, surrounding tubes *c*, another nozzle, *h*, being located as shown, through which the exhaust steam, or the water resulting from condensation thereof, is allowed to pass off.

On the end of the outlet *i* of the blower is fixed a chamber, *j*, in which are fixed a series of distributing-pipes *k*, which may extend any distance and to any locality.

Such pipes are preferably provided with valves or dampers, by which any one or more of the pipes may be opened or closed, so as to control at will the passage of the heated air to different rooms.

As the air enters the tubes *c* from the inlet-pipe *e*, its motion being caused by the action of the fan-wheel within the blower *f*, the heat of the exhaust steam within case *a*, will be conducted through the thin metal of tubes *c*, and will be imparted to the air, and will pass with it into the blower, from which it will be expelled through any or all of the tubes *k*, by which it will be conveyed to its destination, more or less remote, furnishing the apartments in which said tubes terminate with pure warm air, free from gases such as leak through the joints of furnaces in which fuel is consumed.

While the blower has been described as being located so as to draw air through the tubes *c*, it will be seen that it might be so located as to force air through said tubes, in which case the distributing-pipes would be connected directly to the outlet *d* from the tubes *c*, and the fresh air-pipe *e* would be connected directly to the side of the blower.

I claim, in combination with a rotary blower which has its delivery end provided with a series of distributing-pipes, a heater and cooler for utilizing the heat contained in exhaust steam, by transmission of the said heat into air currents, said heater or cooler being composed of a case, having a steam-inlet and outlet air-tubes, and air inlet and outlet passages, substantially as described.

B. F. STURTEVANT.

Witnesses:

J. B. CROSBY,
FRANCIS GOULD.