

No. 874,673.

PATENTED DEC. 24, 1907.

F. W. GREEN.
AIR HEATER.

APPLICATION FILED JAN. 17, 1907.

Fig. 1.

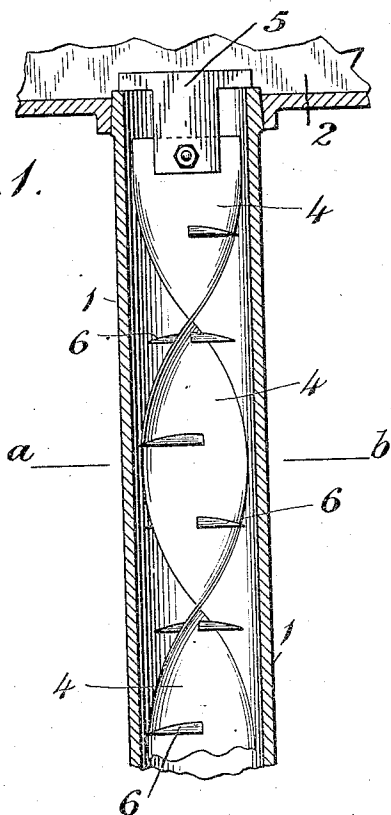


Fig. 2.

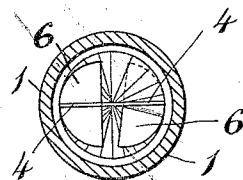
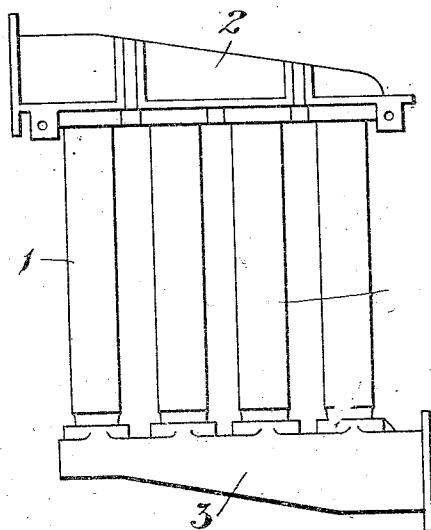


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANCIS WILLIAM GREEN, OF WAKEFIELD, ENGLAND.

AIR-HEATER.

No. 874,673.

Specification of Letters Patent.

Patented Dec. 24, 1907.

Application filed January 17, 1907. Serial No. 352,799.

To all whom it may concern:

Be it known that FRANCIS WILLIAM GREEN, a subject of the King of Great Britain, residing at Economiser Works, Wakefield, Yorkshire, England, has invented certain new and useful Improvements in Air-Heaters, of which the following is a specification.

In one of the ordinary types of heater, the air to be heated passes inside the tubes, receiving heat by contact with the inside surfaces of the tubes, which in turn receive heat from the usual source.

Air is heated by contact only and the present invention consists of wings or vanes or other devices arranged or fitted on a spiral inside of each tube of the heater, the wings or vanes deflecting the air on to the inside surface of the pipe. These wings can be of any angle or bent to any angle, which may be found desirable for the efficient working of the heater. The spiral motion brings the air into contact with a larger heating surface, and the wings split the air up and increase the efficiency of the heater.

My invention will be clearly understood from the following description aided by the accompanying drawings in which:—

Figure 1 is a longitudinal section of an air tube 1 of an air heater, such tube being connected to the top box 2 and bottom box 3, a series forming with a top box and bottom box a section of a heater, any number of such sections being connected together by their top and bottom boxes to form a complete apparatus which is preferably situated in a flue or chimney running from a furnace, the heat from which plays around the outside of the tubes of the heater on its way to the outlet. Fig. 2 is a section through the line *a b* of Fig. 1. Fig. 3 is an elevation of a section of a heater.

According to my invention, I form a spiral 4, which I fit or suspend by a T piece 5 (con-

nected to one end of the spiral 4) inside each pipe 1 of the heater, and on this spiral 4, I rivet, form or otherwise apply wings or vanes 6 so shaped, positioned or bent that they split up the air which flows spirally up or down the tube and constantly deflect it on to the inside surface of the pipe, whereby a greater heat is imparted to the air than would otherwise be obtained by it simply passing through the pipe in a spiral or other manner.

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

1. A heater of the class described comprising a pipe forming a passage-way there-through, a spiral member arranged within the pipe and extending throughout the longitudinal extent thereof, and laterally extending wings with respect to the longitudinal extent of the pipe projecting from said spiral member within the latter and adapted to deflect the heat passing through the pipe intermediate the said spiral and the inner wall of the latter to cause said heat to be dispersed against said inner wall.

2. In combination with a plurality of heating tubes, of spiral members within said tubes and extending throughout the longitudinal extent thereof, a T-element secured to one end of each spiral member and in frictional contact with the piping at one extremity thereof for suspending said spiral members within the pipes, and a plurality of wings secured to said spiral members and extending laterally therefrom with respect to the longitudinal extent of the tubes.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANCIS WILLIAM GREEN.

Witnesses:

HARRY KENYON,
W. B. GREENER.