

No. 688,301.

Patented Dec. 10, 1901.

W. E. GOODWIN.
AIR CHAMBER FOR HOT AIR HEATERS.

(Application filed Aug. 22, 1900.)

(No Model.)

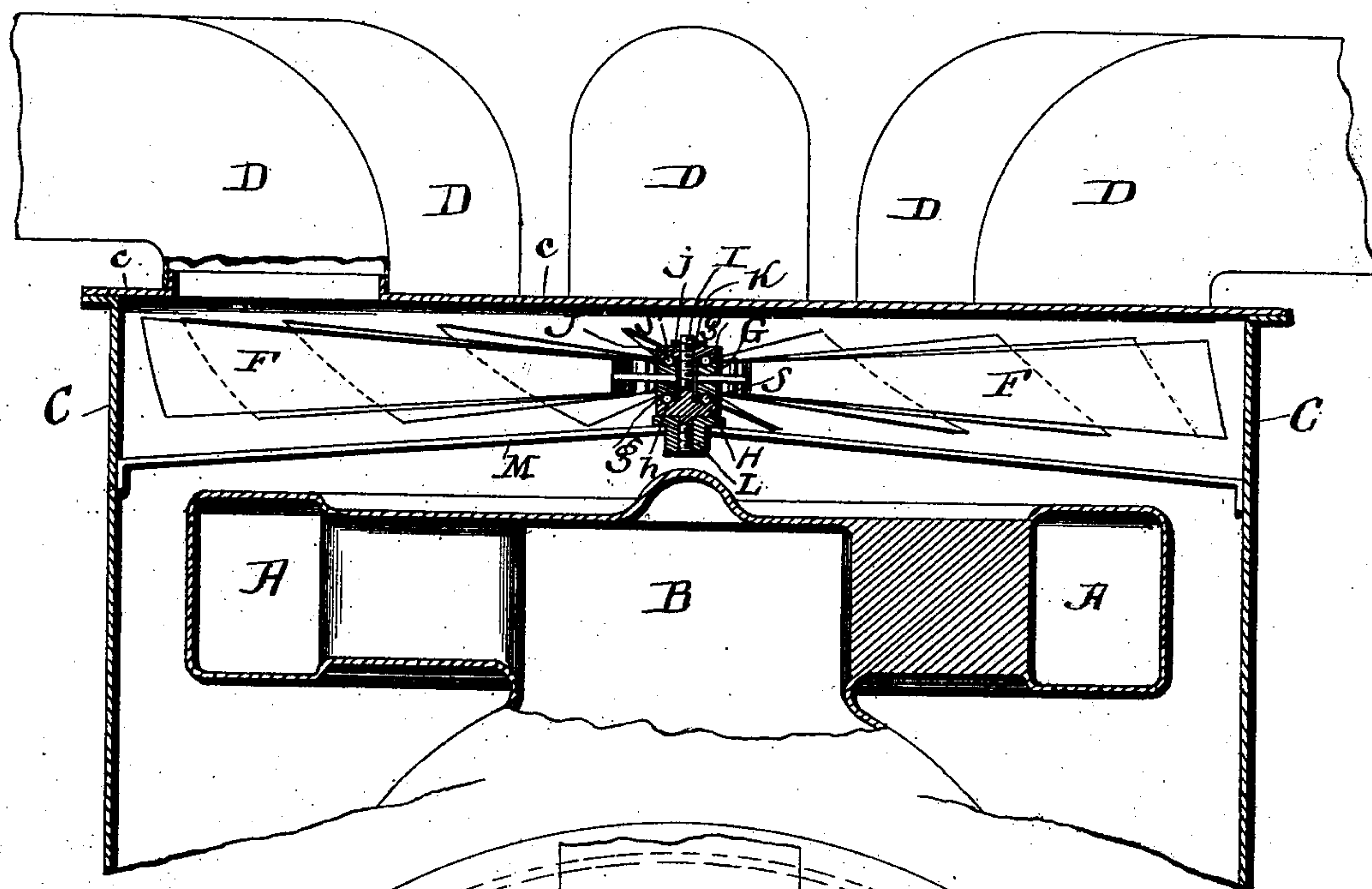


Fig. 1.

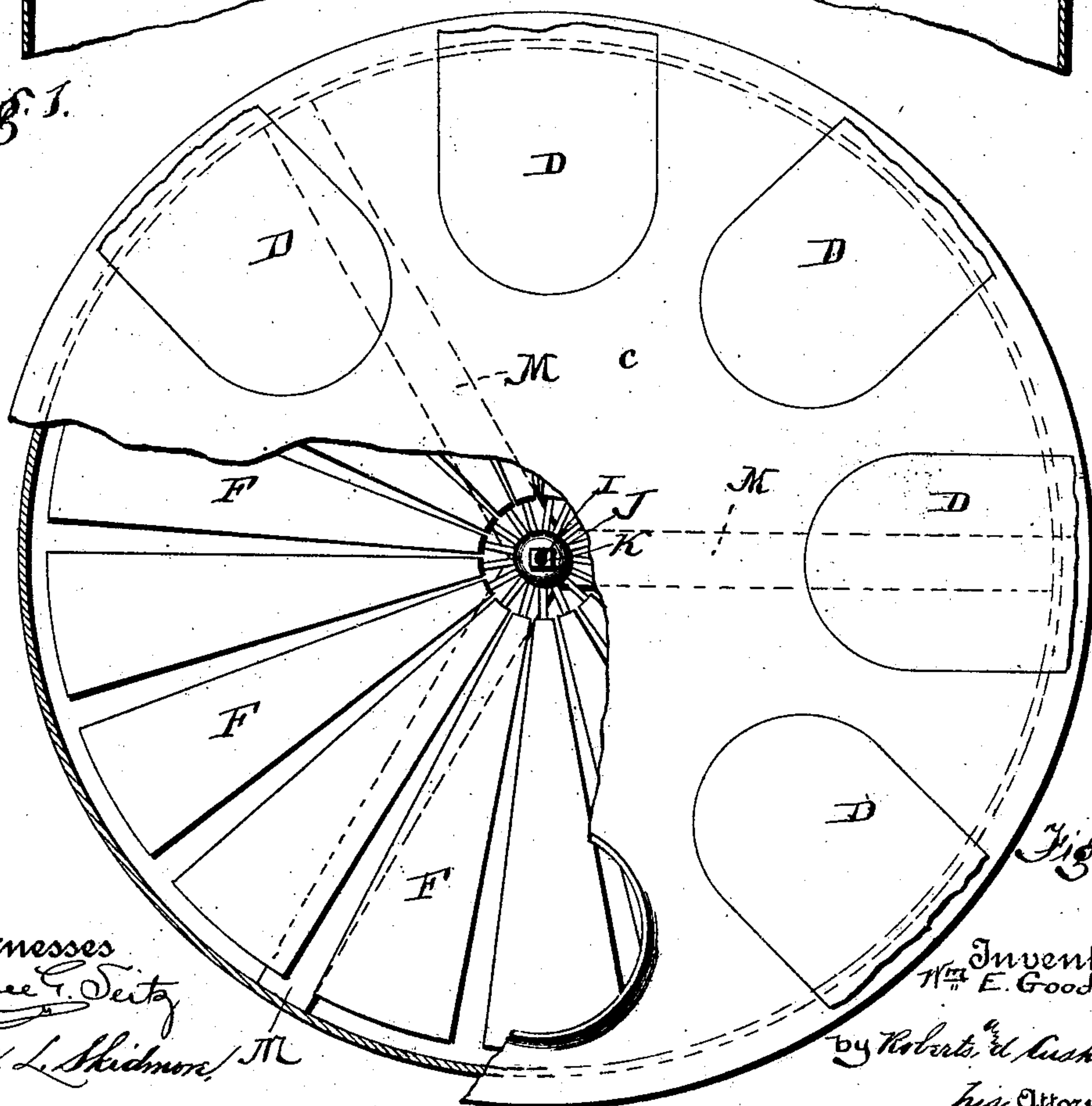


Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM E. GOODWIN, OF MANCHESTER, NEW HAMPSHIRE.

AIR-CHAMBER FOR HOT-AIR HEATERS.

SPECIFICATION forming part of Letters Patent No. 688,301, dated December 10, 1901.

Application filed August 22, 1900. Serial No. 27,671. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. GOODWIN, a citizen of the United States, residing at Manchester, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in the Air-Chambers of Hot-Air Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the upper air-chamber of a hot-air furnace and to which the hot-air conductors are connected.

The object of the invention is to cause the hot air to enter and to be freely distributed through all conductors leading from said air-chamber in substantially equal quantity and velocity.

It is well known to all persons who have had experience with hot-air furnaces that the air will invariably charge those conductors which happen to possess the best draft, to the exclusion of those less fortunately located or those which have the least draft, the result being that one or more rooms in a building will be without heat except when the registers in the other rooms (through which the hot air freely flows) are closed. To obviate this difficulty, large furnaces which are located in buildings where power is used have been provided with rotary fans within the air-chamber and mounted on a shaft extending outside of said chamber and provided with a belt-pulley for obtaining the necessary power. This method is well enough when power is accessible; but in private dwellings a power-driven fan is not available, and, as far as I am aware, for furnaces of ordinary capacity the problem of equal distribution of heated air through all the outlets or conductors still remains to be solved. A power-driven fan for this purpose has one advantage—viz., by the proper regulation of its speed it may be made to increase the circulation to a certain extent, in accordance with the available heat, by drawing the cold air into the heating-chamber and forcing the heated air out through the conductors; but my present object is simply to provide a certain and sure distribution of the heated air equally into and through all the conductors leading from the

hot-air chamber of a hot-air furnace of ordinary capacity, as above stated.

Hence my invention consists in providing a rotary fan so located within the hot-air chamber of a hot-air furnace as to be revolved in close proximity to the hot-air conductors by the natural hot-air circulation, said fan being preferably of a size to substantially fill said hot-air chamber and mounted in a manner to cause the least possible obstruction to the free passage of hot air through the same to the said conductors, as will be fully set forth in the following specification and claims and clearly illustrated in the drawings accompanying and forming a part of the same, of which—

Figure 1 is a vertical sectional view showing the upper portion of a hot-air furnace within which my improved hot-air distributor is applied, Fig. 2 being a broken plan view of the same.

Similar reference-letters denote corresponding parts in both views.

A represents the radiator, B the dome, and C the outer case or hot-air chamber, from the top horizontal plate or cap *c* of which project the hot-air conductors D. The hot-air-distributing fan may be mounted in any convenient manner between the dome B and cap *c* best adapted to render its motion as free as possible from friction, and for this purpose I show the fan provided with ball-bearings.

F represents the deflected wings of the fan, which wings are attached at equal intervals to a hub G. The hub is provided in its ends with an annular groove *g* and is centrally perforated.

H is a circular disk formed integral with or shrunk upon a spindle I, said spindle being threaded at both ends, as shown. The disk is provided in its upper face with an annular groove *h*, carrying balls S, upon which rests the lower grooved face of the hub G. Balls S' are also disposed in the groove in the upper face of the hub G, and a collar J is threaded to the upper end of the spindle I and provided in its under face with an annular groove *j*, which rests upon the balls S', and after adjusting said collar, as required, a check-nut K is threaded to said spindle to hold said collar in proper position. The lower end of the spindle I is threaded to a block L,

which is supported centrally within the hot-air chamber C by suitable bars M. But three of these supporting-bars are necessary, and their outer ends are firmly secured to the case C, as shown. As the fan is driven solely by the ascending heated air, (being located directly in the normal path of movement of the air,) it will be obvious that its rapidity of movement will correspond with the velocity of the heated air, so that there is always a relative uniformity of movement between the ascending air-currents and the fan. There is therefore no liability of attempting to force the passage of air through the furnace, such as would be the case were the fan driven by external power or power emanating from a fixed movement of a motor. In such latter case there is a constant tendency of the fan to draw in a greater quantity of air than can be properly heated by the products of combustion, in which case the air being distributed constantly varies in temperature, there being no means for controlling the speed of the fan relative to the heating capacity. Furthermore, the location of the fan within the chamber close to the entrances of the conduits D (the latter being at the top of the chamber) prevents any tendency of the air to in any way become free from the distributing action of the fan prior to the entrance to the conduits. Where the fan is located some distance from the entrance to the conduits, the influence of the fan as a radiating medium is lost to a great extent, owing to the tendency of the air to resume its normal condition after passing the fan. Hence the air again becomes subjected to the action of the draft, as hereinbefore set forth. The fan thus mounted is very sensitive and revolves very freely and necessarily carries the hot air in equal quantity to all the conductors,

thus avoiding the one difficulty common to all hot-air furnaces.

Having described my improvements, what I claim is—

1. The combination with a hot-air furnace having at its top an air-chamber substantially narrow vertically; conduits leading from the top of said chamber; and a passage-way or passage-ways for the ascending heated air leading to said chamber; of a rotating radiating fan located in the path of movement of the ascending air and driven solely thereby, said fan lying substantially close to the entrance to said conduits, where by the movement of the fan will be controlled solely by the velocity of the heated air and the air be passed directly into the conduits while subject to the movement of the fan.

2. The combination with a hot-air furnace, comprising an outer casing, a radiator forming with the top of said casing an air-chamber, and conduits leading from the top of said chamber, of a distributor-fan journaled centrally of said air-chamber and almost completely filling the same, the vanes of said fan projecting beneath and in close proximity to the mouths of said conduits, and also projecting above the entire surface of the radiator and in close proximity thereto, said fan being driven solely by the natural circulation of the air and adapted to receive all the hot air from the radiator and to distribute the same to all the hot-air conduits in substantially uniform quantities.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM E. GOODWIN.

Witnesses:

J. B. THURSTON,
JOHN H. ANDREWS.