

(No Model.)

H. C. STEINHOFF.
HOT AIR FURNACE.

No. 564,804.

Patented July 28, 1896.

FIG. 1.

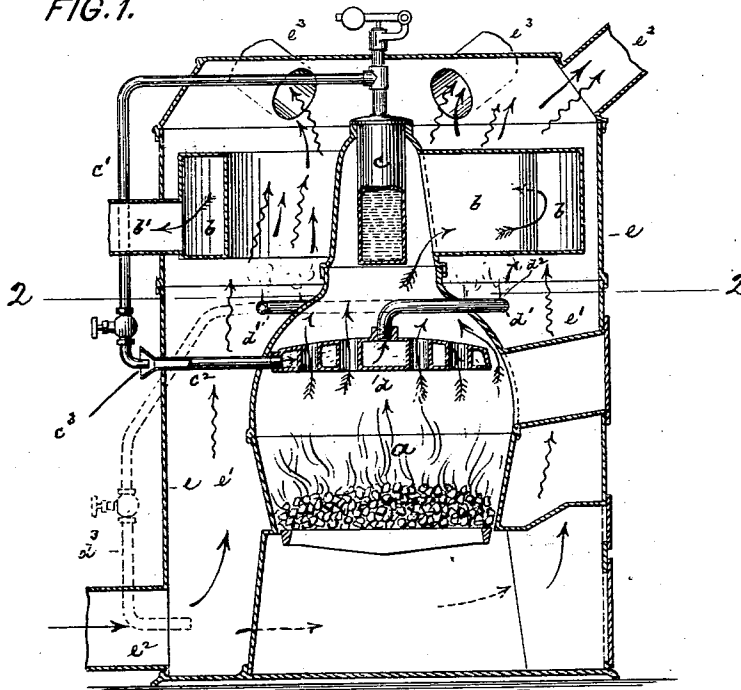
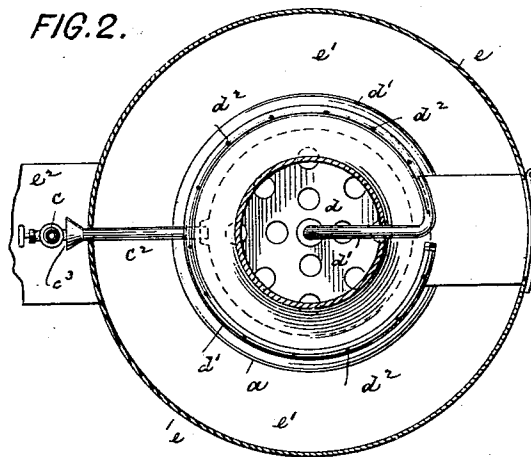


FIG. 2.



Witnesses:

John Becker
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HENRY C. STEINHOFF, OF WEST HOBOKEN, NEW JERSEY.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 564,804, dated July 28, 1896.

Application filed March 20, 1896. Serial No. 584,047. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. STEINHOFF, of West Hoboken, Hudson county, New Jersey, have invented an Improved Hot-Air Furnace, of which the following is a specification.

This invention relates to a furnace by means of which a body of air is heated and mixed with superheated steam, so that the steam serves to drive the air through the registers of the various rooms, while the quantity of moisture admitted to the rooms is limited.

In the accompanying drawings, Figure 1 is a vertical central section of my improved hot-air furnace; and Fig. 2, a cross-section on line 2 2, Fig. 1.

The letter *a* represents the fire-chamber of the furnace that connects at its upper end with a smoke-flue *b*. This flue is preferably of annular form, so as to give off its heat, and has its exit at *b*.

Within the upper portion of the chamber *a* there is suspended a small steam-boiler *c*, of suitable construction. Steam-pipes *c'* conduct the steam from boiler *c* to a perforated superheater *d*, located above the grate and beneath the boiler. Thus it will be seen that the heat from the fire-pot has access to the superheater as well as to the boiler. The pipe *c'* terminates in a nozzle *c''*, which enters the flaring mouth of pipe *c''*. In this way an injector is formed by which air is drawn by the steam into the superheater. From the superheater the mixture of air and dry steam flows into a coiled pipe *d'*, having a number of perforations *d''*, through which the mixture is ejected in an upward direction. The entire fire-chamber, including the delivery-pipe *d'*, is inclosed by a shell *e*, between which and the body of the furnace an air-heating chamber *e'* is formed. Cold air is admitted to this chamber at *e''*, while the heated air is conducted to the registers of the various rooms by a number of flues or pipes *e'''*.

In use, the steam delivered by the pipe *d'* will cause a strong flow of air through chamber *e'* and into the flues *e'''*. The steam will

of course mix with the air and constitute a forcing agent by which the hot air is freely driven to remote and weather-exposed rooms, so that a fine heating effect is obtained.

By superheating the steam and mixing it with a body of air at *c''* the steam is so divided and dried that the quantity of moisture admitted to the rooms is limited and that the steam will not condense upon the windows. Of course the steam may be discharged and mixed with the heated air at any desirable point, such, for instance, as the air-inlet opening *e''*, as is indicated by the dotted pipe *d'''*.

In my improved furnace the flow of air to the rooms is always in proportion to the volume of steam ejected. That is to say, if the fire is low and little steam is consequently made, a proportionately small volume of air will be drawn into the chamber *e'*, and will be driven into the building. In this way I avoid the possibility of driving an insufficiently-heated or an entirely cold body of air into the rooms.

What I claim is—

1. In a hot-air furnace the combination of a fire-chamber with a steam-boiler, a superheater connected therewith, a hot-air chamber surrounding the fire-chamber, and a steam-delivery pipe that discharges the steam from the superheater into the hot-air chamber, substantially as specified.

2. In a hot-air furnace the combination of a fire-chamber with a steam-boiler, a superheater, steam-pipes connecting the boiler with the superheater, an air-injector communicating with the steam-pipes, a hot-air chamber surrounding the fire-chamber, and provided with an air inlet and outlet, and a steam-delivery pipe that discharges the steam from the superheater into the hot-air chamber, substantially as specified.

HENRY C. STEINHOFF.

Witnesses:

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