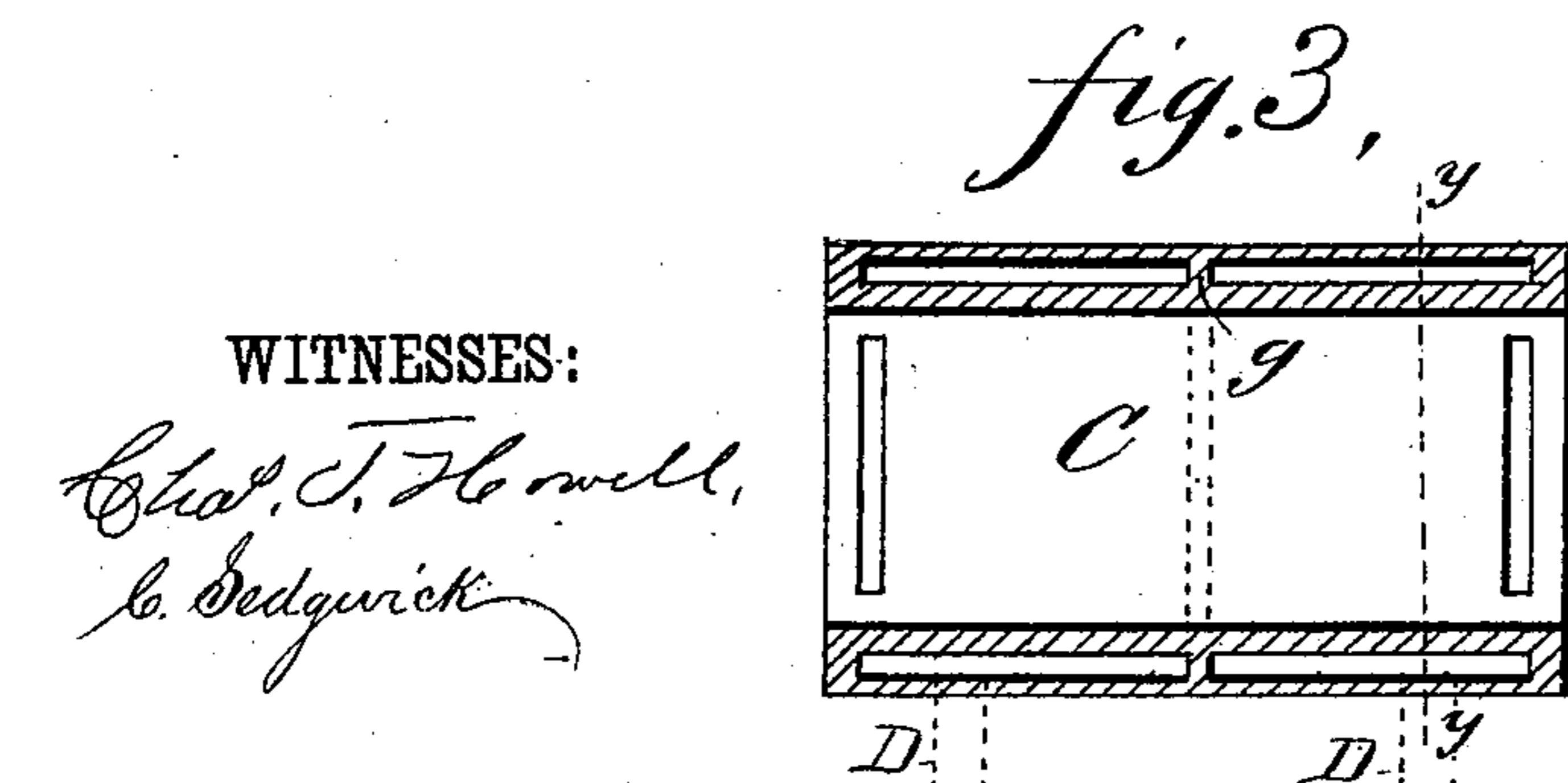
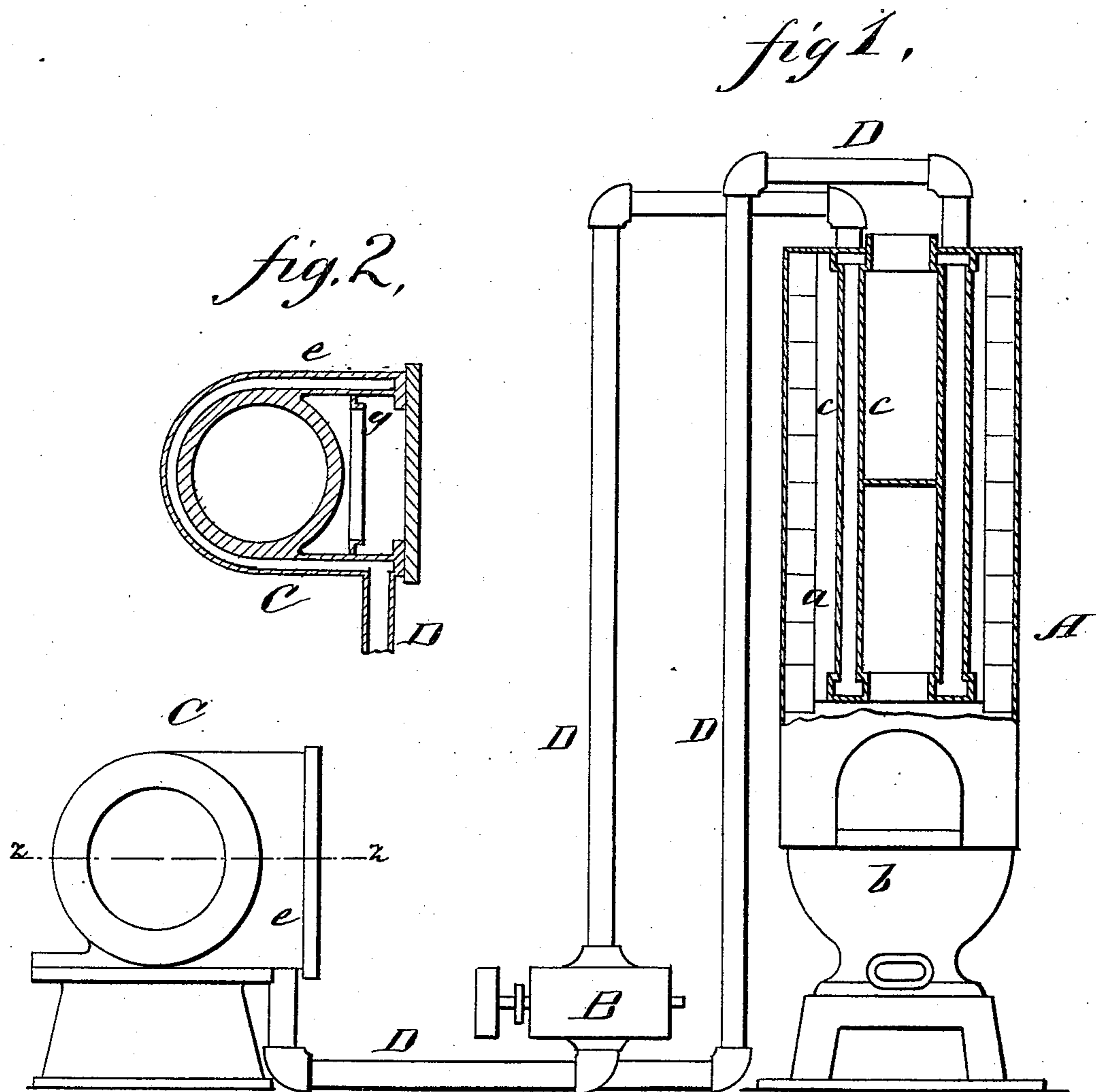


(No Model.)

C. W. CRAWFORD

MEANS FOR PREVENTING CONDENSATION IN STEAM CYLINDERS.
No. 292,104.

Patented Jan. 15, 1884.



WITNESSES:

Chas. T. Howell,
C. Sedgwick

INVENTOR:

C. W. Crawford
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UNITED STATES PATENT OFFICE.

CHARLES W. CRAWFORD, OF BRAZIL, INDIANA.

MEANS FOR PREVENTING CONDENSATION IN STEAM-CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 292,104, dated January 15, 1884.

Application filed April 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. CRAWFORD, of Brazil, in the county of Clay and State of Indiana, have invented a new and
5 Improved Means for Preventing Condensation in Steam-Cylinders, of which the following is a full, clear, and exact description.

The object of my invention is to prevent condensation of steam in engine-cylinders, and
10 also to superheat the steam.

The invention consists in the application of a current of hot air to jacketed cylinders, a blower being used to maintain circulation of the air from a heater to the cylinder and back,
15 as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

20 Figure 1 is a sectional elevation of a heater, steam-cylinder, and blower, with circulation-pipes designed to carry out the invention. Fig. 2 is a transverse section on line *y y* of Fig. 3, and Fig. 3 is a longitudinal section of
25 the steam-cylinder on line *z z* of Fig. 1.

A is a stove or heater. B is a blower, and C an engine-cylinder. The heater, as shown, is constructed exclusively for the purpose of heating the air, and has a heating-chamber, *a*,
30 above a fire-pot, *b*. Within the chamber *a* are concentric cylinders *c c*, having space between them closed at the ends, so as to form an air-chamber, the inner chamber serving as the escape-flue for the products of combustion.
35 D D are pipes connected to the air-chamber in the stove and passing to the steam-cylinder C, where they connect to the jacketed space, one pipe, D, being also connected to the blower

B. The cylinder C is formed with a jacket, *e*, its whole length, and the heads are to be hollow, to connect with the jacketed space by suitable openings. Preferably the space around the cylinder is divided by a partition, *g*, and the pipes D, connected at the ends, so as to secure a circulation around the ends and over
45 the whole length of the cylinder.

In operation the blower will draw the air from one end of the cylinder and force it through the air-chamber of the heater and through the pipe to the other end of the cylinder, thus keeping up a circulation of air,
50 which is heated by its passage through the stove. The air being heated to a temperature greater than the steam in the cylinder, condensation is prevented and the steam super-
55 heated.

The heater may be of any suitable construction, and in place of a special heater a coil of pipe may be placed in the boiler-furnace and connected to the blower. I do not limit myself in these respects, nor to arrangement in
60 any respect exactly as shown.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The heater A, having the heating-chamber *a* between concentric cylinders *c c* around a central smoke-flue, in combination with pipes D D, blower B, and cylinder C, having jacket *e*, whereby the air will be drawn from the cylinder, forced through the heater, and back to
70 the cylinder continuously, as and for the purpose specified.

CHARLES W. CRAWFORD.

Witnesses:

ELIAS S. HOLLIDAY,
C. A. MATZINGER.