

Cornwall's Heating Furnace.

PATENTED

74051 Figure 1.

FEB 4 1868

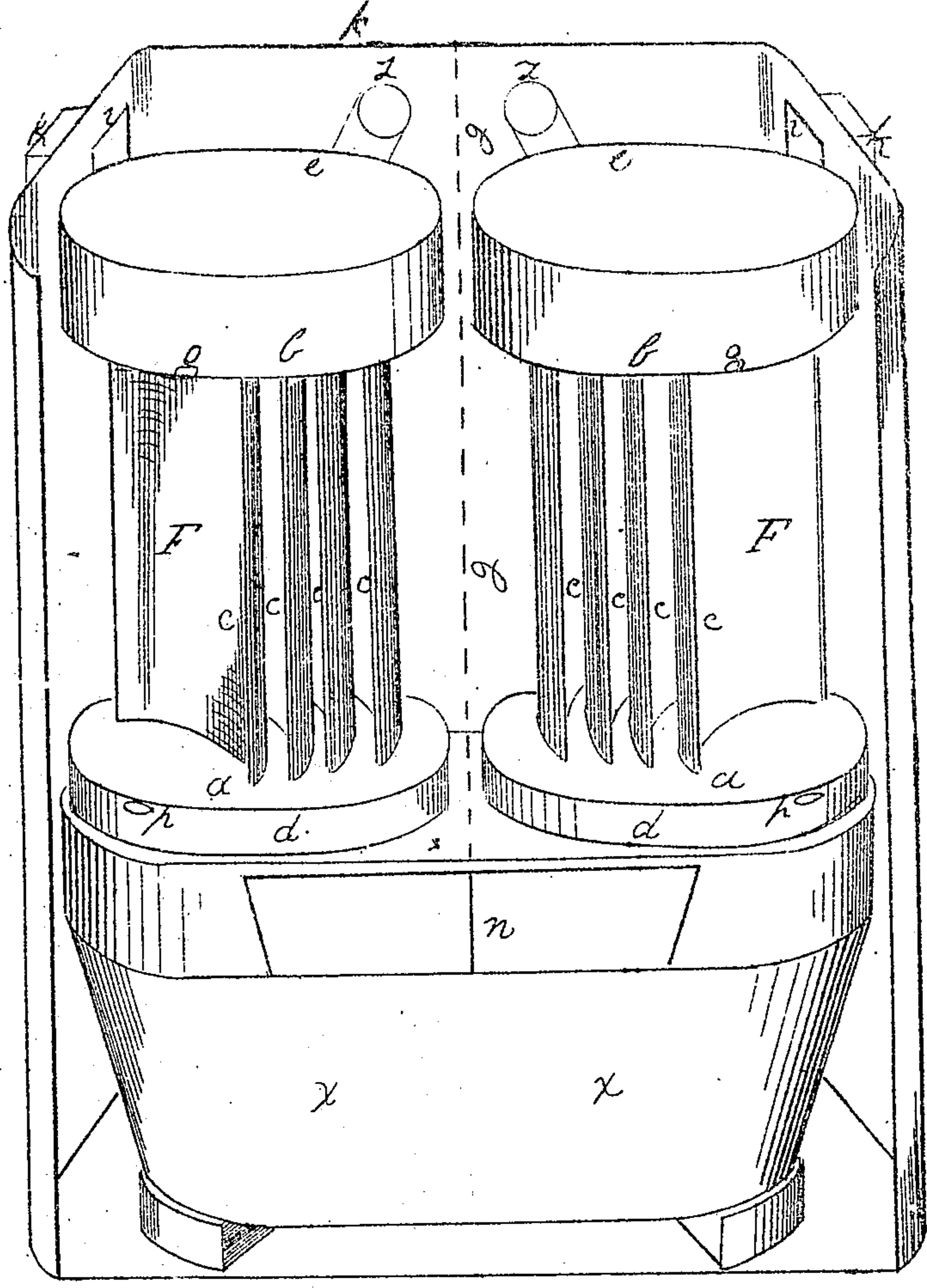


Figure 2.

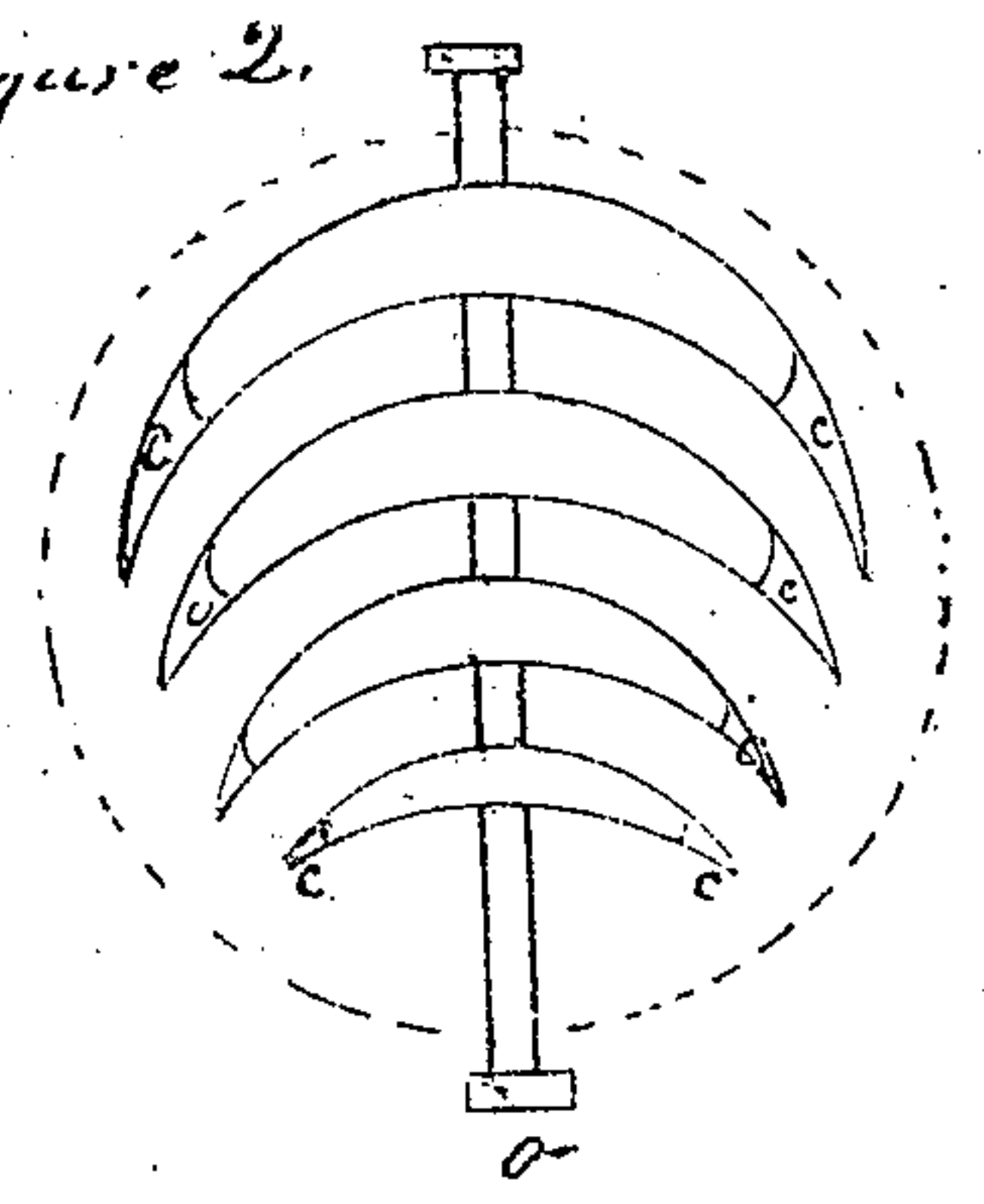
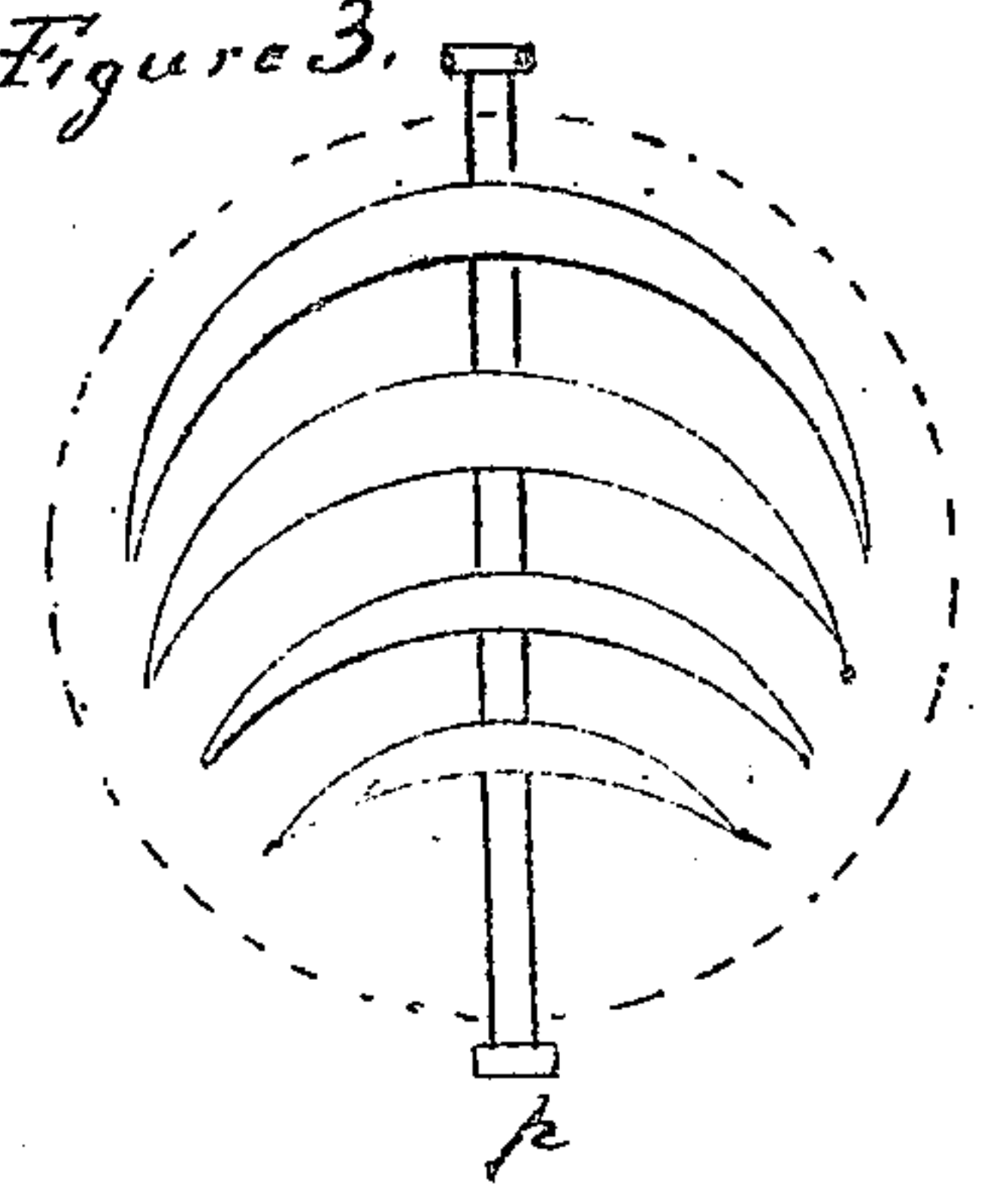


Figure 3.



Witnesses
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NATHANIEL E. CORNWALL, OF NEW YORK, N. Y.

Letters Patent No. 74,051, dated February 4, 1868.

IMPROVEMENT IN HEATING-FURNACES.

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, NATHANIEL E. CORNWALL, of the city of New York, and State of New York, have invented a new and useful Machine for Increasing and Distributing the Heat of Stoves and Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the interior of a heating-furnace, the front view being an elevation presented by a vertical section near the front of the furnace, and the perspective at the top showing a transverse section near the top of the furnace. In this figure, F and F are two radiators, so placed that they may be used together or separately to distribute the heat from one fire-pot of a hot-air furnace or heater. The base, *a*, of each radiator is set upon the fire-pot of a stove or furnace, or connected with the fire-pot or other heat-generator by a shallow chamber, *d*, and a short pipe or pipes. Upon the base, *a*, are set several pipes, *c c c c*, which are crescent-shaped in their orifices, and vary in number and capacity according to the size and capacity of the fire-pot, and form channels for the passage of the heat, together with the smoke and gas, to the chamber *b*, from which an orifice at *e*, or any other convenient point, affords the outlet by a flue-pipe to the chimney. In this figure *o* and *o* show the position in each radiator of a crescent-check damper, which is placed upon the base of the chamber *b*, and, when closed, nearly covers the orifices of all the pipes, but leaves in each a sufficient passage for a portion of the heat to the chamber *b*, and also for any residuum of smoke or gas which may need to escape by the flue-pipe and chimney. In this figure, *p* and *p* show the position in each radiator of a crescent-close damper, which is placed under the base, *a*, and when closed, entirely covers the orifices of the pipes of the radiator. *k k k* show three sides of the wall or case of the hot-air chamber, which is divided into separate compartments by a partition of non-conducting material, indicated by the dotted lines *g g*; and *x x* is a fire-pot, so constructed, or graduated with a movable partition, seen at *n*, and a self-adjusting grate in each part, as to afford heat for one radiator or more; the smoke-pipes from *e*, or any other point in the chamber *b*, of each radiator, passing through the wall or case of the hot-air chamber at *z z*, or any other convenient points. Pipes for conveying the heated air to distributing-registers are attached to the hot-air chamber at *v v*, or any other points, and separate cold-air pipes for each compartment of the hot-air chamber introduced at convenient points in the front part of the wall or case, so as to convey heat to a part of the house, or the whole, at pleasure, and secure the passage of heat to every system of registers. The stops in these cold-air pipes may also be respectively connected with the close dampers *p* and *p*, at the base of each radiator, so that when the damper at the base of either radiator is closed, and that radiator not heated, the cold air will be shut off from that compartment and its registers.

Figure 2 represents the crescent-check damper, which nearly covers the orifices of all the pipes of the radiator at the top. In this figure, the converging lines at *c c c c* indicate those parts of the orifices of the pipes of the radiator which are not covered by the check-damper, and the dotted circle the outline of the base of the chamber *b*, fig. 1.

Figure 3 represents the crescent-close damper, which entirely closes the orifices of the pipes of the radiator at the base. The dotted circle in this figure indicates the outline of the base of the radiator.

By removing the movable partition of the fire-pot, and closing the damper at the base of one radiator, nearly the whole of the heat generated over both grates of the fire-pot may be conveyed to a single compartment of the hot-air chamber, and thus to a single system of registers for a part of the house; or, by means of a door in the partition of the hot-air chamber, the heat from the fire of a single grate in one part of the fire-pot may be conveyed to both compartments of the hot-air chamber, and made to supply both systems of registers. By this arrangement a great variation may be made in the amount of heat afforded by the furnace, according to the temperature of the season and the wants of each part of the house.

A single radiator, placed over the fire-pot of any stove, or connected with it by a pipe or pipes, and enclosed in a suitable hot-air case, to which a hot-air pipe and registers may be attached, forms a small heating-furnace for one or more rooms.

The radiator, herein described, is made of sheet iron, cast iron, or any other material of which stoves and furnaces may be made, and operates by presenting the largest radiating-surface that can be obtained around a

given space for the passage of the heat generated. It thus brings the largest amount of the heat from any given fire most directly to the radiating-surface, and most effectually increases and distributes the heat generated by any given amount of fuel.

A practical test of the radiator as an apparatus for the rapid increase, radiation, transmission, and distribution of heat, and for conducting flame and smoke and any residuum of unconsumed gas from the fire-pot to the flue-pipe to which the radiator is adapted, has been made by the inventor in various ways with perfect success.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The radiator, consisting of the base, *a*, with pipes *c c c c*, and the chamber *b*, or chambers *b* and *d*, substantially as described and for the purposes set forth.

2. The crescent-check damper, and the crescent-close damper, constructed substantially as described, and arranged so as to operate in the manner and for the purposes shown.

3. The fire-pot, constructed in two parts, substantially as described, and so arranged with separate radiators in separate compartments of the hot-air chamber of a furnace, and separate systems of hot-air pipes and distributing-registers, as to convey all the heat from both parts of the fire-pot to one system of registers, or to distribute the heat from one part of the fire-pot to every system of registers, at pleasure.

N. E. CORNWALL.

Witnesses:

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JER. LODER.