Daniel Vaughan
Assignor to
Self, A. L. Helm & J. B. Mahoney

Imp't in

Steam Heating & Condensing Apparatus

117127 PATENTED JUL 18 1871

Fig. 1

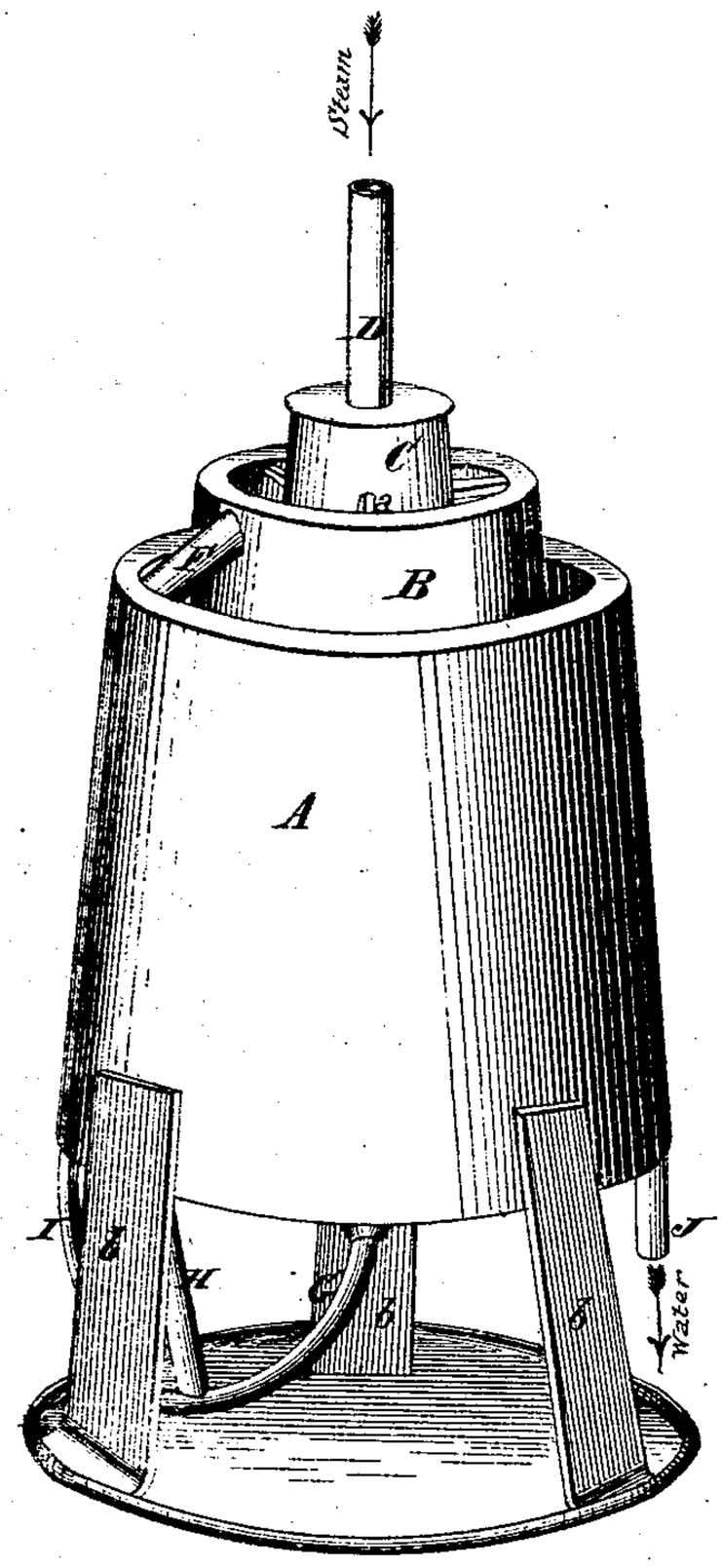
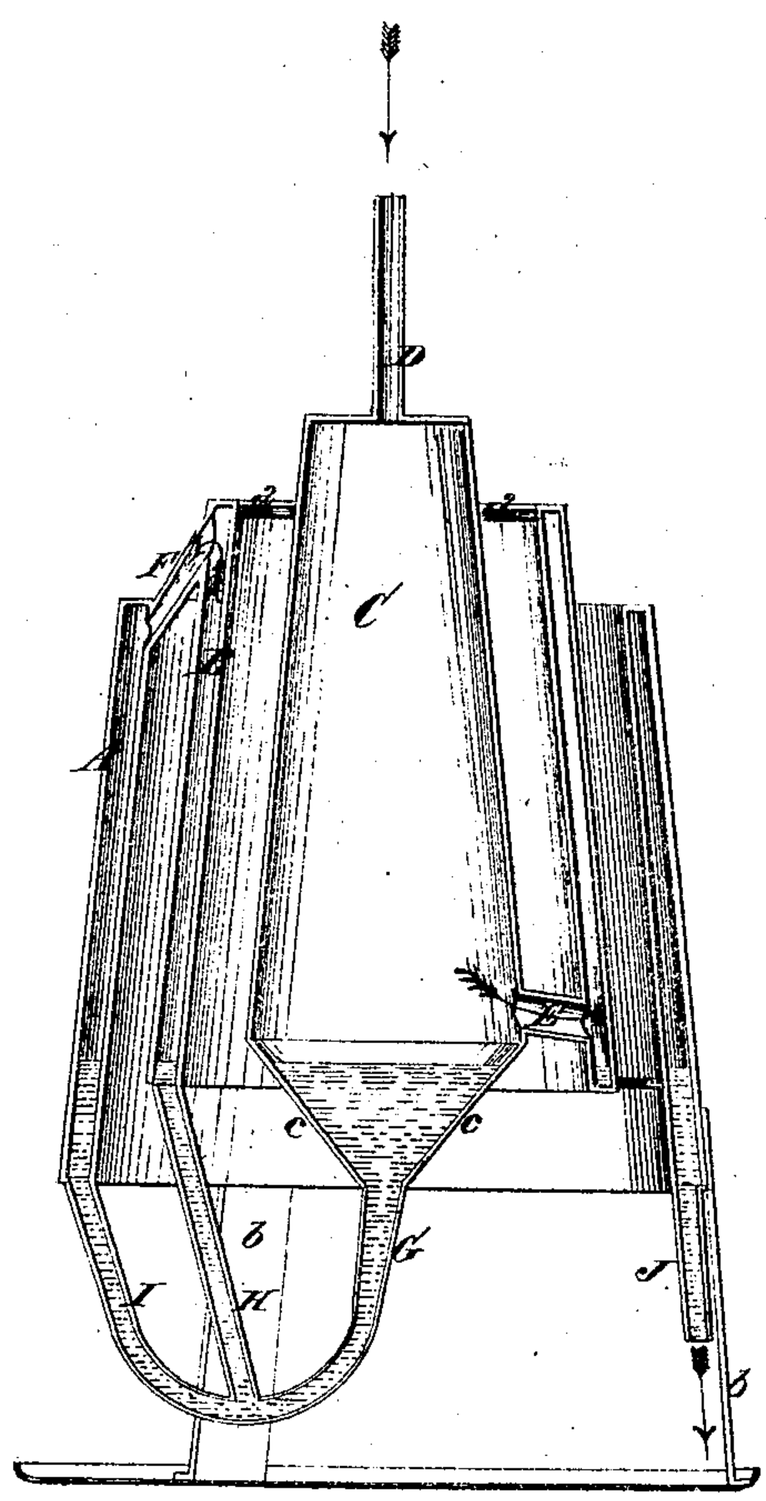


Fig. 2



Attest
H. Emory Millard
Elitha A. Layman.

Inventor
Daniel Vaughan
By H. Millard
attorney

UNITED STATES PATENT OFFICE.

DANIEL VAUGHAN, OF CINCINNATI, OHIO, ASSIGNOR TO HIMSELF, AUGUSTUS L. HELM, AND JOHN B. MAHONEY.

IMPROVEMENT IN STEAM-HEATERS.

Specification forming part of Letters Patent No. 117,127, dated July 18, 1871.

To all whom it may concern:

Be it known that I, DANIEL VAUGHAN, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Steam-Heating and Condensing Apparatus, of which the following is a specification:

My invention relates to apparatus for heating buildings by the exposure of a steam-heated metallic surface to the air of the room to be heated, or for condensing vapor by the exposure of a large cooling-surface to the outer air; and my invention consists of an apparatus composed of a series of concentric annular chambers with either cylindrical or truncated conical sides, the chambers being connected by pipes at the bottom for the united discharge of condensed vapor, and supplied with steam at the top. My invention further consists in a peculiar arrangement of the steam-supply and steam-circulating pipes connecting the annular chambers, by which the steam is not compelled to pass at any time through water or condensed vapor. My invention is designed to afford a great amount of very effective heating or cooling-surface with a cheap and simple construction, and also to permit the use of steam of a very low pressure.

Figure 1 is a perspective view of my improved heater or condenser. Fig. 2 is an axial section of the same.

The apparatus is composed principally of a number of annular chambers, A B, concentrically surrounding a chamber, C. The chambers A B are each bounded by cylindrical or truncated conical sides and annular top and bottom, and the chamber C may either have cylindrical or tapering sides, with a top of any preferred form, and a bottom, *c*, preferably an inverted cone. The chambers are connected together by suitable stays *a* and supported on the legs *b*. The steam may be conveyed to the chambers in separate pipes, the pipes varying in size in proportion to the surface of each chamber; but I prefer that the steam-connection be made in the following manner: The supply-pipe D is connected to the top of chamber C, the chamber C is connected to chamber B by the pipe E near the bottom, and the chamber B connects with chamber A near the top by means of pipe F. The course of the steam in this method of connection is shown by the arrows. The chambers A B C are united together at the bottom for the free discharge of water or condensed vapor by the pipes G H I, the liquid being allowed finally to escape at pipe J through a steam-trap or open pipe.

In the operation of the apparatus the steam has always a free unobstructed passage from one chamber to the other, the collection and discharge of water offering no impediment to the passage of steam. A very low pressure of steam can, therefore, be used with absolute certainty of its reaching all parts of the apparatus, and the pressure may be such an infinitesimal quantity that it may be generated in some cases in a vessel having an open-topped safety water-tube to balance the pressure and prevent any excess. The condensed water may be returned to the boiler in the usual way.

In ordinary contrivances for warming buildings by steam an enormous pressure of steam is required to prevent too great an accumulation of condensed water in the pipes and overcome the friction in long-corroded pipes.

My device permits the use of tin in its construction, which is cheaper and better adapted for heating purposes than thick iron, such as is used in pipe-heaters. Its form also makes it better adapted for throwing off a greater quantity of heated air than any device heretofore used, a very rapid current being created in the annular spaces between the annular chambers and interior cylinder.

The apparatus may be used for condensing vapors of all kinds in distilling processes.

I claim—

1. A steam-heating or vapor-condensing apparatus, composed of a series of annular chambers, A B, one within the other, connected and operating substantially in the manner and for the purpose specified.

2. In the described combination with the chambers A B C, the pipes D E F for the supply and circulation of steam, and pipes G H I for the discharge of water, the whole being connected and operating substantially in the manner and for the purpose specified.

In testimony of which invention I hereunto set my hand.

DANIEL VAUGHAN.

Witnesses:

FRANK MILLWARD,

ELITHA F. LAYMAN.