J. C. HENDERSON.

Hot Air Furnace.

No. 37,228. Patented Dec. 23, 1862.

Fig. 2,

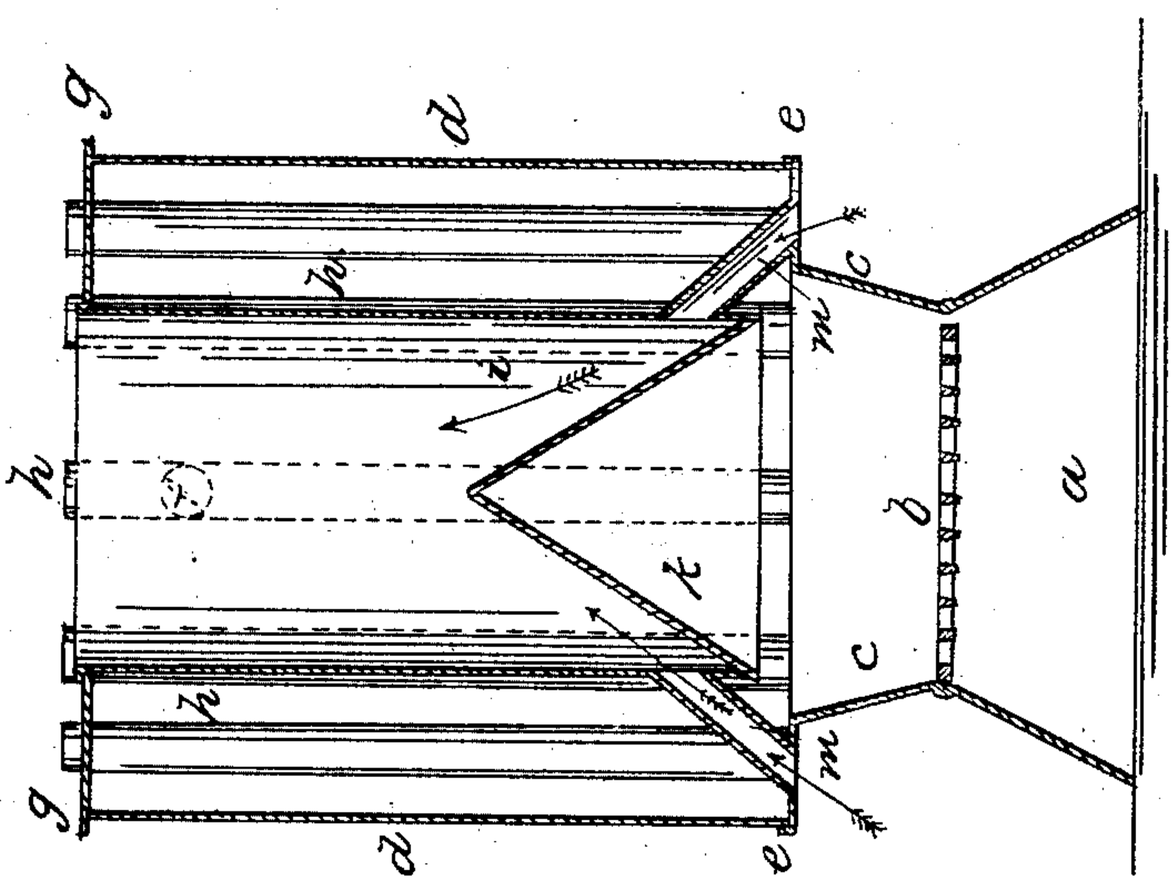
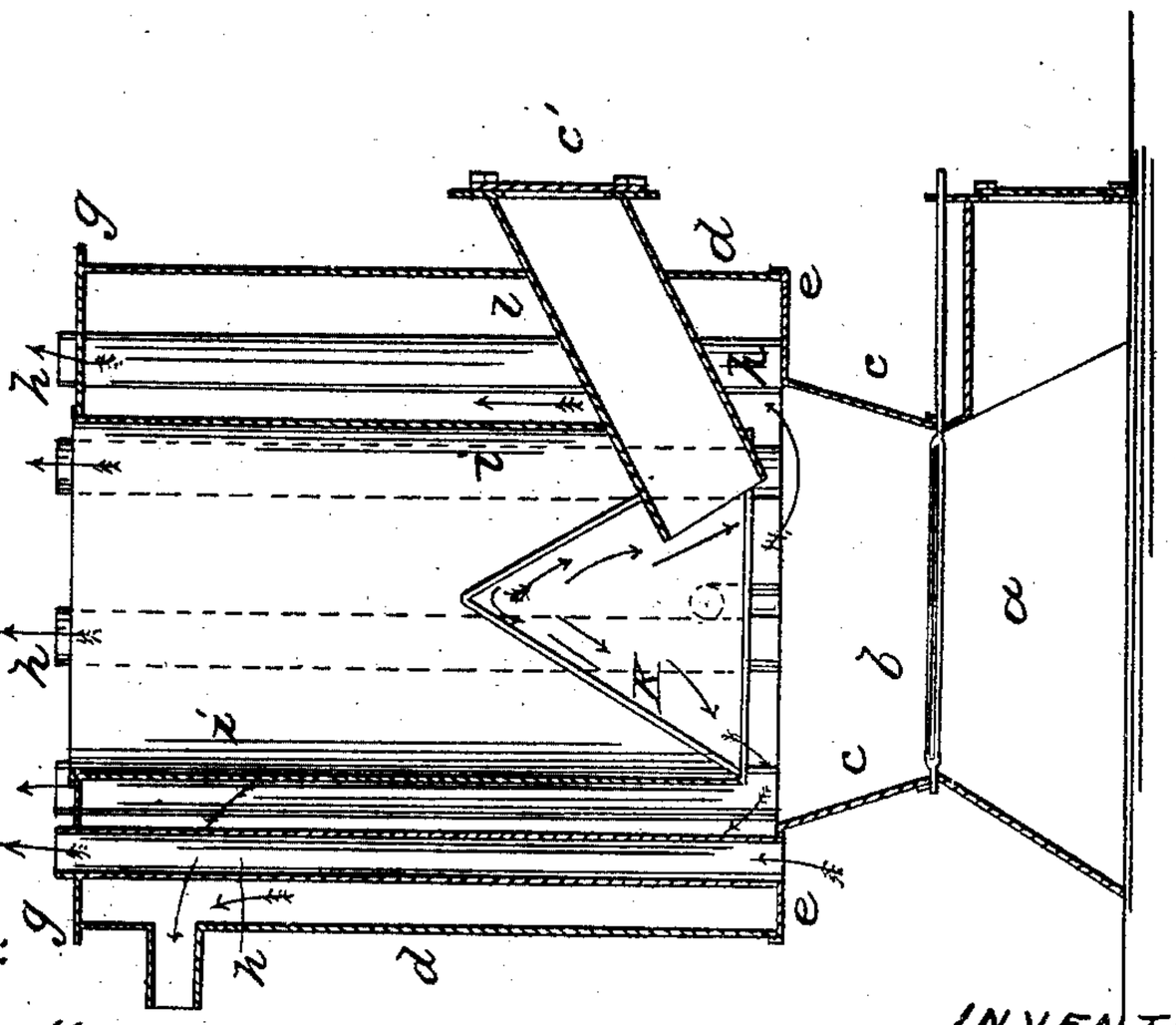


Fig. 1,



WITNESSES:

A. V. G. DeWitt
John VanDyck

INVENTOR:

J. C. Henderson

UNITED STATES PATENT OFFICE.

JOSEPH C. HENDERSON, OF ALBANY, NEW YORK.

IMPROVEMENT IN HEATERS.

Specification forming part of Letters Patent No. **37,228**, dated December 23, 1862.

To all whom it may concern:

Be it known that I, JOSEPH C. HENDERSON, of Albany, in the county of Albany and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Heaters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a vertical section through the supply-door, and Fig. 2 is a similar vertical section of my heater at right angles to Fig. 1.

Similar marks of reference denote the same parts.

The nature of my said invention consists of a conical chamber over the fire and within an inclosing-cylinder, which cone retains the gaseous products sufficiently long to insure a perfect combustion before such products pass away from an annular opening at the base of said cone, in combination with a vertical range of hot-air pipes around the base of said cone and within the inclosing-cylinder, so that the products of combustion passing away from the base of aforesaid conical chamber come directly in contact with said inclosing-case and said range of vertical pipes, thereby increasing the efficiency of said case and pipes in imparting heat to the surrounding air, because said parts are more thoroughly heated than they would be if the heat simply circulated in a cylindrical drum of pipes without said conical chamber. Above this conical chamber I introduce a cylinder open at the top and provided with air-pipes at the bottom, so that a current of air circulates through this cylinder, carrying off heat from the conical combustion-chamber and from its cylinder. I am therefore enabled not only to obtain a perfect combustion of the fuel, but also to direct the heat to the radiating-surfaces and obtain a large extent of such radiating-surface in a small space.

In the drawings, *a* is the ash-pit. *b* represents the fire-grate; *c*, the fire-box. *d* is a cylinder rising above the annular plate *e*, that projects from the fire-box *c*. *f* is the pipe for the escape of the products of combustion to a chimney, and *c'* is the door at which the fuel is supplied. *g* is a plate on the top of the cylinder *d*, similar to the plate *e*, and both these plates *e* and *g* are perforated with corresponding holes that receive the ends of the vertical pipes *h h*, that become a range of vertical circulating hot-air pipes, giving off heat to the surrounding air. *k* is a cone over the fire, forming a conical combustion-chamber that retains the products of combustion from the fire in the box *c* sufficiently to perfect said combustion, the gases, &c., passing away from the lower edge between that and the cylinder *d*, and in contact with the said pipes *h*, to heat the same thoroughly, as aforesaid. The chute *l*, passing from the door *c*, through one side of the cone *k*, supplies the fuel to the fire. The conical combustion-chamber *k* is at the base of and rises within the cylinder *i*, which cylinder is sustained at its upper end by the annular plate *g;* and *m m* are pipes from this cylinder *i*, opening through the plate *e*, so that a current of air will circulate through these pipes *m m* and cylinder *i*, as indicated by the arrows, and, coming in contact with the conical combustion-chamber *k*, will abstract heat therefrom and prevent the same becoming too hot, and said heat, as well as that of the cylinder *i*, pipes *h h*, and cylinder or case *d*, will be diffused in the surrounding atmosphere. I am thus enabled to obtain a large extent of heating-surface, and also effect a perfect combustion of the fuel.

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

1. The range of vertical hot-air pipes *h h* within the cylinder *d*, in combination with the cone *k*, that deflects the products of combustion against the base of said pipes and cylinder for the purposes and as specified.

2. The conical chamber *k*, in combination with the cylinder *i* and air-pipes *m m*, as and for the purposes specified.

In witness whereof I have hereunto set my signature this 29th day of September, 1862.

J. C. HENDERSON.

Witnesses:

A. V. DE WITT,

JOHN VAN DYCH.