J. E. GRIDLEY.

HEATING-STOVES.

No. 194,552. Patented Aug. 28, 1877.

Fig. I.

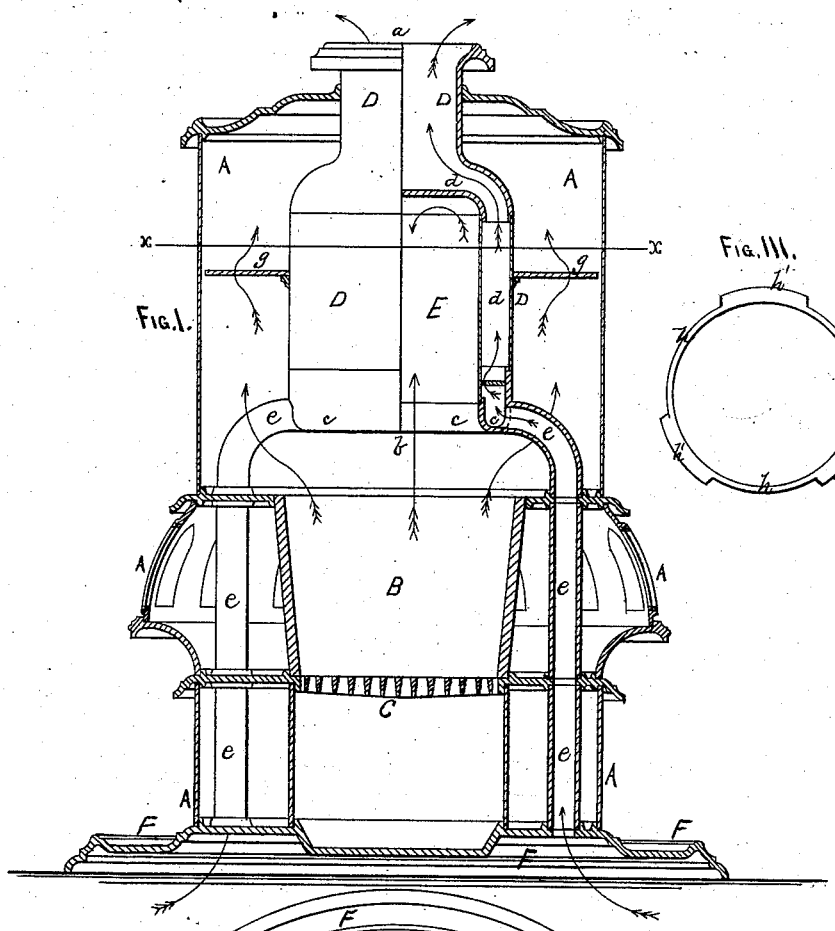


Fig. III.

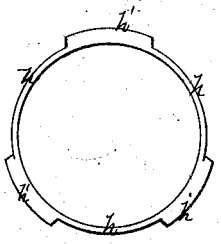
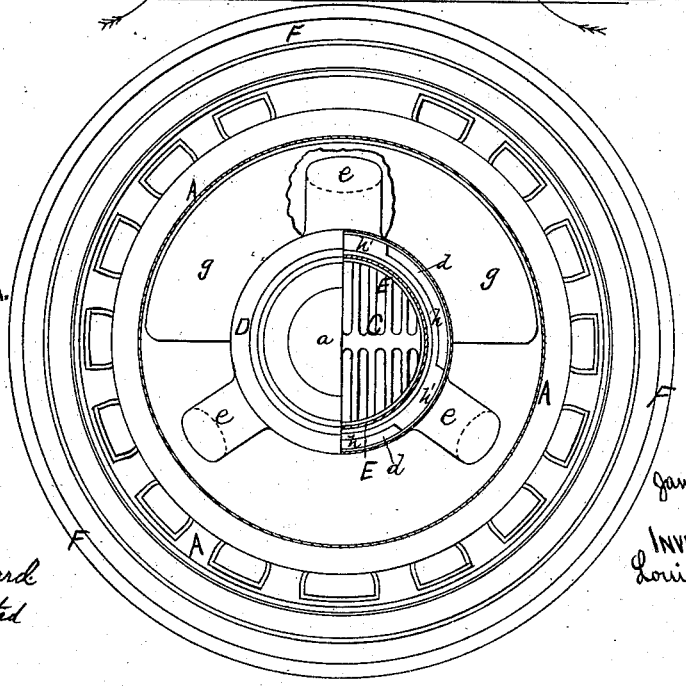


Fig. II.



Witnesses.
E. N. Woodward
John T. Halsted

James Emmet Gridley
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UNITED STATES PATENT OFFICE.

JAMES E. GRIDLEY, OF ST. PAUL, MINNESOTA.

IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. **194,552**, dated August 28, 1877; application filed June 11, 1877.

To all whom it may concern:

Be it known that I, JAMES EMMET GRIDLEY, of St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Heating-Stoves, which improvement is fully set forth in the following specification, and accompanying drawing, in which—

Figure 1 is a sectional side elevation. Fig. 2 is a plan view through the line *x x*. Fig. 3 is view of the heat check and spreader detached.

This invention relates to stoves and furnaces for heating purposes, and is an improvement on my patent of June 13, 1876, No. 178,764.

The invention consists in a double drum or generator suspended in the shell of the stove, in the fire-chamber, above the fire, and having communication with the outside through a series of cold-air tubes, passing up inside the shell of the stove, from the bottom of the stove near the floor, said generator being provided with a heat check and spreader to distribute the entering air over every part of its interior surface, as hereinafter specified.

A is the outer casing or shell of the stove; B, the fire-pot; and C the grate, all arranged in the usual manner. Suspended in the shell A in the fire-chamber, (above the fire,) is a heat-generator, consisting of an outer drum, D, open at the top *a*, and an inner drum, E, open at the bottom *b*. These two drums are connected together at the bottom by a metal ring, *c*, thus forming an air-space, *d*, between them, as shown.

e e e are a series of tubes, which commence at the bottom of the lower plate F, near the floor, and, passing up inside the shell A, between it and the fire-pot B, end in the outer drum D, and thus connect the air-space *d* with the outside air, forming cold-air conduits through the stove.

h is a diaphragm, placed in the lower part of the air-space *d*, just above the tubes *e*, and having extended hoods *h'*, directly opposite each tube, to check the entering air and throw it to either side, causing it to completely fill the air-space *d*, and come in contact with every part of the two drums D and E.

The operation is as follows: When the fire is first lighted, the cold air already in the tubes *e* and generator D E, becoming heated, rises upward and passes out through the opening *a*, thus forming vacuums in the tubes and generator, which are at once refilled by cold air from below, which, as fast as it is heated, passes off at the opening *a*.

By this arrangement I obtain a very large amount of heating-surface, as the tubes, from the ash-pit upward, are surrounded by hot air, and consequently the air in them must be correspondingly heated, so that it enters the generator in a heated state.

By the form and position of the generator and conduits I utilize all the heat arising from the fire, and obtain a very high temperature, which enables me to superheat the air passing through the generator, and throw it out in a very pure state—the superheating of air, as is well known, completely neutralizing all noxious gases and vapors.

This latter result alone is a very important one.

A very large percentage of the heat which has heretofore passed off with the smoke is, by this arrangement, caught in the interior of the inner drum E, and utilized to heat the air in the space *d*.

The generator may be used to advantage in some cases on top of an ordinary stove.

Any number of the tubes *e* may be used, and they may be placed either inside or outside the shell A, but I prefer them arranged as shown.

The exit *a* may be placed in the upper part of the side of the shell A, if desired.

I am acquainted with the patent of S. H. Kreider, July 6, 1875, No. 165,335, who shows a generator very much like mine; but his conduits pass up outside the stove, and the air is carried into the generator at the same degree of temperature as the outside air; while in mine, the air in passing through the

tubes—which pass up inside the shell in close proximity to the fire—is heated before it enters the generator.

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

The combination and arrangement of the generator D E, heat check and spreader *h h'*, and conduits *e e*, substantially as hereinbefore described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES EMMET GRIDLEY.

Witnesses:
C. N. WOODWARD,
H. P. GOODENOW.