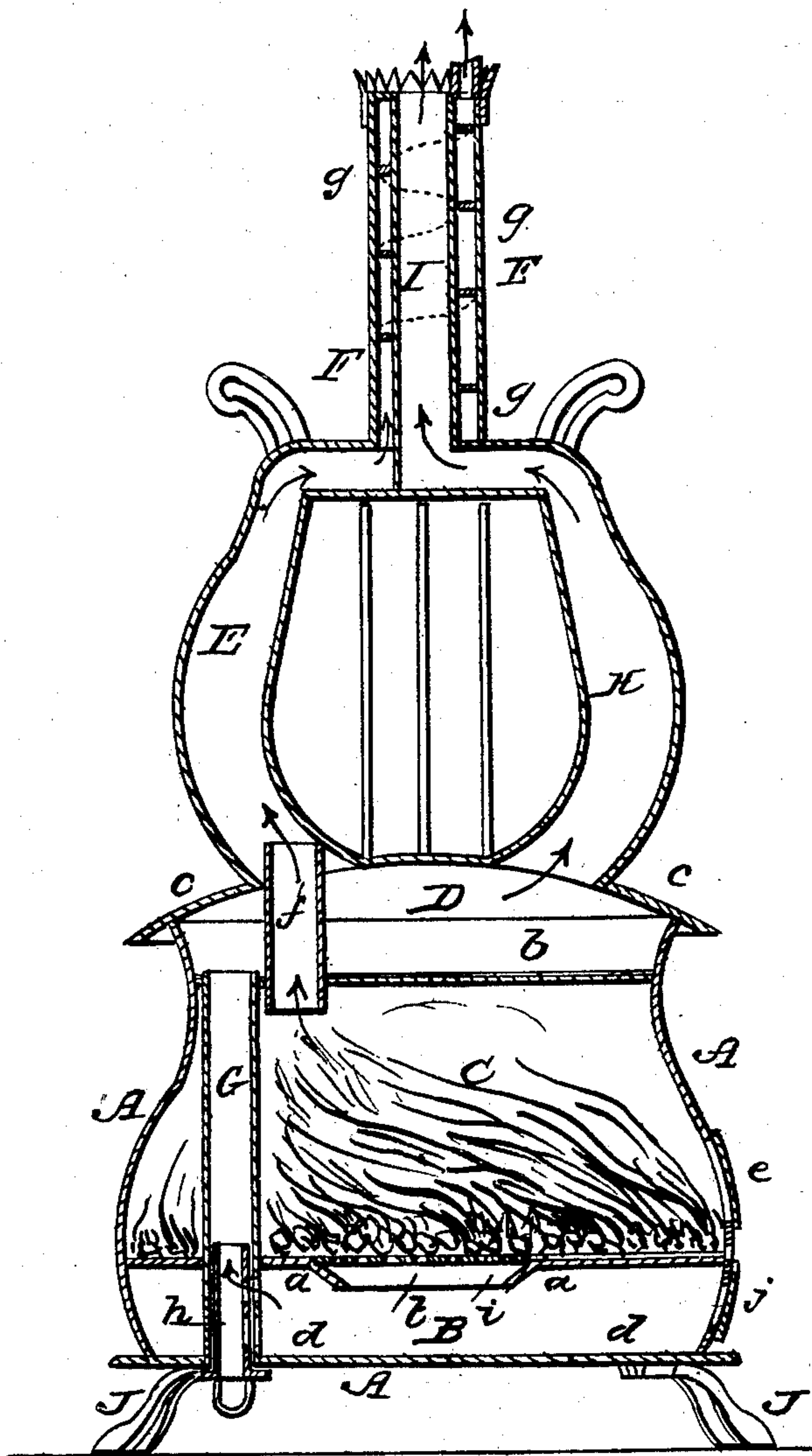


F. RAITH.
Heating Stove.

No. 90,464.

Patented May 25, 1869.



Witnesses
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FRANCIS RATH, OF CALUMET, MICHIGAN, ASSIGNS ONE-THIRD TO
EDMUND F. KRELLWITZ, OF SAME PLACE.

Letters Patent No. 90,464, dated May 25, 1869.

IMPROVEMENT IN COAL-STOVES.

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, FRANCIS RATH, of Calumet, in the county of Houghton, and State of Michigan, have invented a new and improved Heating-Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which the drawing represents a vertical longitudinal section of my improved heating-apparatus.

The object of this invention is to utilize the heat of the products of combustion in a wood or coal-burning stove, and to thereby economize fuel.

The invention consists in a novel arrangement of air-passage, by which the air is carried through the stove, and through the smoke-pipe, to become heated.

A, in the drawing, represents a stove, of suitable form and size, made of metal, or other suitable material.

It is provided with two horizontal partitions, *a* and *b*, between its top and bottom plates, *c* and *d*, respectively, and consists thus of three apartments, B, C, and D. The largest middle compartment, C, is the fire-chamber, and has a door, *e*, to receive the fuel.

Through a pipe, *f*, the products of combustion traverse the upper chamber, and enter a pipe, E, by which they are conducted into an annular pipe, F, which is formed into a spiral channel by a spiral partition, *g*, so that the products of combustion will be detained to give off their heat to the inner and outer sides of the said annular pipe F.

The cold air enters the lower chamber B through an opening *j*, and becomes heated by the heated plate *a*, so that it will become lighter. It will then ascend

in a pipe, G, which conducts it into the upper chamber D, where it becomes thoroughly heated by the plate *b*.

The air thus heated ascends in a pipe, H, and enters a pipe, I, which passes through the annular smoke-pipe F, as is clearly shown in the drawing.

The air, leaving the pipe I, enters the apartment, and serves to heat the same, adding to the heat already radiated by the stove.

The lower end of the tube H is provided with apertures through which the air enters.

These apertures may be closed by a sleeve, *h*, when no more air can pass up through H, D, and I.

For burning wood, the plate *a* is made unperforated, and the pipe H open. For coal, however, a grate, *i*, is placed over an opening in the plate *a*, and the pipe H is closed, so that the cold air will pass through the grate and fire, as in ordinary coal-stoves, to aid the consumption of the fuel.

The stove is supported on suitable legs, or supports, J J.

In the drawing, the course of the smoke is shown by black, and that of the air by red arrows.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

The stove, consisting of the three compartments B C D, and provided with the pipes *f* E, and spiral annular pipes F, and with the pipes G, H, and I, all arranged, combined, and operating substantially as herein shown and described.

FRANCIS RATH.

Witnesses:

CHRISTOPH ROEHM,
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