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L. R. COMSTOCK.

Heating-Stoves.

No. 141,765. Patented August 12, 1873.

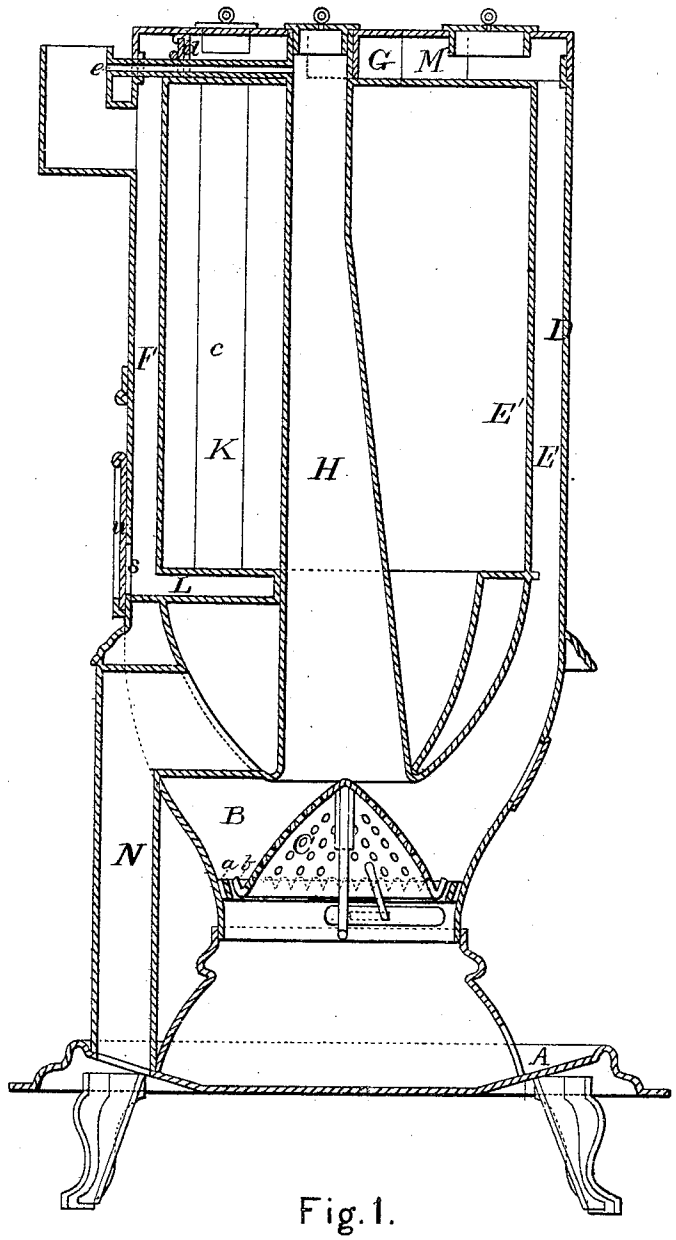

Fig. 1.

WITNESSES

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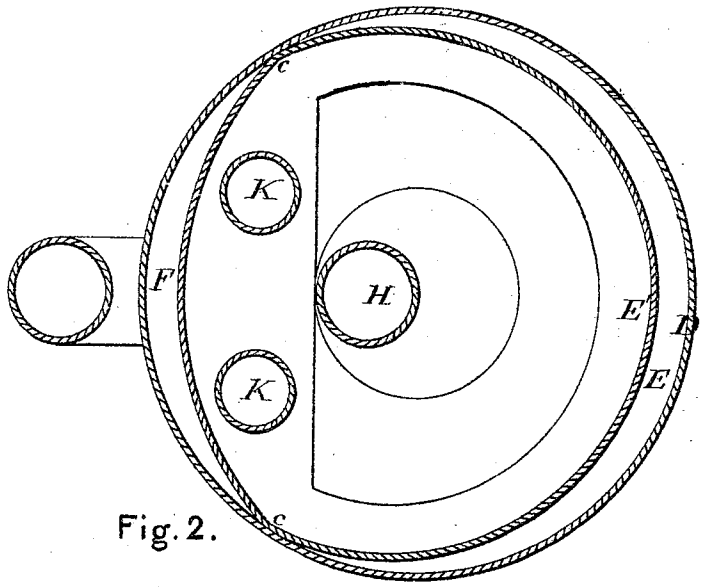
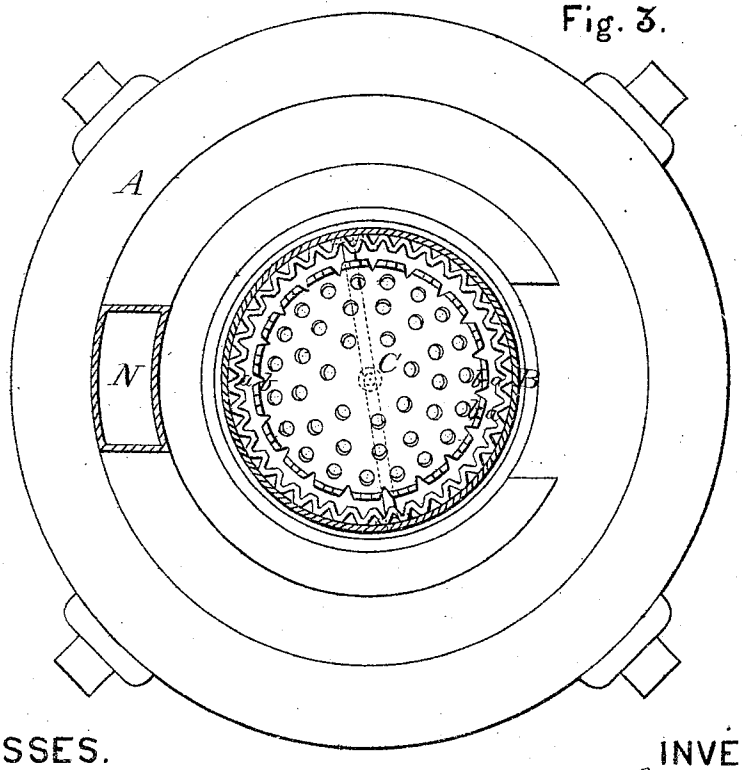


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

LEVI R. COMSTOCK, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. **141,765**, dated August 12, 1873; application filed January 18, 1873.

To all whom it may concern:

Be it known that I, LEVI R. COMSTOCK, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and valuable Improvement in Heaters; 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, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical central section of my invention. Fig. 2 is a cross-section of my invention. Fig. 3 is a cross-section of my invention.

This invention has relation to self-feeding furnaces or heaters; and it consists in the elliptical or widened form of the hot-air chamber, whereby it is brought directly in contact with the external casing at the sides, affording space for the passage of the smoke and heated products of combustion in a broad sheet-like current. It also consists in the construction and novel arrangement, in connection with the broad flues above referred to, of the dip-tubes designed to carry the heated products of combustion downward through the hot-air chamber; in the arrangement of the hot-air pipes by which they are carried vertically through the broad horizontal smoke-flue over the top of the hot-air chamber, whereby the air is directly heated as it is discharged from the hot-air chamber; and in the arrangement of the coal-chute within the hot-air chamber, all as hereinafter set forth.

The object of the present invention is to heat the air in the chamber and flues as much as possible without interfering with the draft; and in order to accomplish it the flames and heated products of combustion are first spread over the front wall of the hot-air chamber in a thin sheet current, then conducted through the interior of said chamber by dipping flues, and finally spread over the back portion of the chamber in a broad sheet-like current, thence passing off through the smoke-pipe. In furtherance of this object, the draft is kept clear at the grate by grinding up the clinkers and other obstructions which may form at this point, and the different flues are arranged so that they will not impede the draft.

In the accompanying drawings, the letter A designates the base of the furnace or heater, above which is arranged the fire-pot B, within which is located the horizontally-rotating grate C, preferably constructed in conoidal form. The fire-pot wall is provided with an annular series of serrations or projections, *a*, immediately around the grate, the edge of which is correspondingly serrated at *b*, for the purpose of grinding up the clinkers and other obstructions which fall toward the periphery of the grate in between its serrations and those of the fire-pot wall. D indicates the exterior casing of the furnace or heater, within which is located the hot-air chamber E′, having an elliptical or widened form, so that it will touch or be in contact with the inner wall of the casing along the vertical lines *c*, thus dividing the surrounding space between its exterior surface and the inner wall of the outer casing into two broad flues, E and F, communication between which may be made directly by opening the damper *d* in the broad transverse flue G between the top of the hot-air chamber and the top of the casing. H indicates the coal chute or magazine, passing downward from the top of the outer case through the middle of the hot-air chamber to its base, opening at its lower end directly over the grate. Having this air-chamber around it, this chute is kept cooler than it would be if surrounded by the heated products of combustion. Partial combustion and the formation of gas are not, therefore, so liable to take place. K K indicate descending or dipping flues, which pass through the hot-air chamber, communicating through a broad horizontal flue, L, with the rear flue F, which lies between the rear wall of the hot-air chamber and the outer case. When the damper *d* is closed the smoke and products of combustion pass down through these dip-flues, and then upward through the broad flue F to the exit-opening of the smoke-pipe. The damper *d* separates the space between the top of the hot-air chamber and the top of the flue into two compartments, communicating, respectively, with the broad flues E and F at the front and back of the hot-air chamber. The gas which may be formed in the coal-chute is passed off through the pipe *e* into the smoke-pipe. This pipe *e* passes back

through the smoke-flues, and, being carried direct to the smoke-pipe, serves to assist the draft. At the base of the broad back flue F an air-opening, *s*, is made, and closed by a slide-valve, *u*, by means of which the strength of the draft may be controlled. M indicates the air-pipes, which lead the hot air upward. These pipes are passed vertically through the broad transverse smoke-flue G, and thus the air is heated directly at its exit from the hot-air chamber. The valve-opening *s* is made rather large, and serves as a convenient passage for clearing out the flue F. Suitable openings are made in the top of the heater for the purpose of clearing the other flues. N represents the cold-air pipe, leading from the base of the stove into the hot-air chamber. The rear smoke-flue F extends downward to the horizontal flue L, which is situated at about the commencement of the vertical wall of the hot-air chamber, the lower or conoidal base of this chamber being unobstructed, so that the direct heat of the flames may be applied to the entire surface of said base, in rear as well as in front.

It may be here observed that the position of the wide and shallow flue L is such that the direct action of the fire will reheat the smoke and products of combustion, accelerating the draft at the commencement of the passage of the smoke up the broad flue F to the smoke-pipe.

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

1. The arrangement of the elliptical inner hot-air chamber E′ within the outer casing D, so that its sides shall touch the inner wall of said casing, dividing the space between into the crescent-shaped flues E and F, substantially as specified.

2. The combination, with the broad flues E F G L, of the dipping-flues K, the hot-air chamber, and the exterior case, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

LEVI R. COMSTOCK.

Witnesses:
GEO. E. UPHAM,
PHIL. C. MASI.