

H. T. LOVE.

Modes of Burning Water for Fuel.

No. 157,011.

Patented Nov. 17, 1874.

Fig. 1.

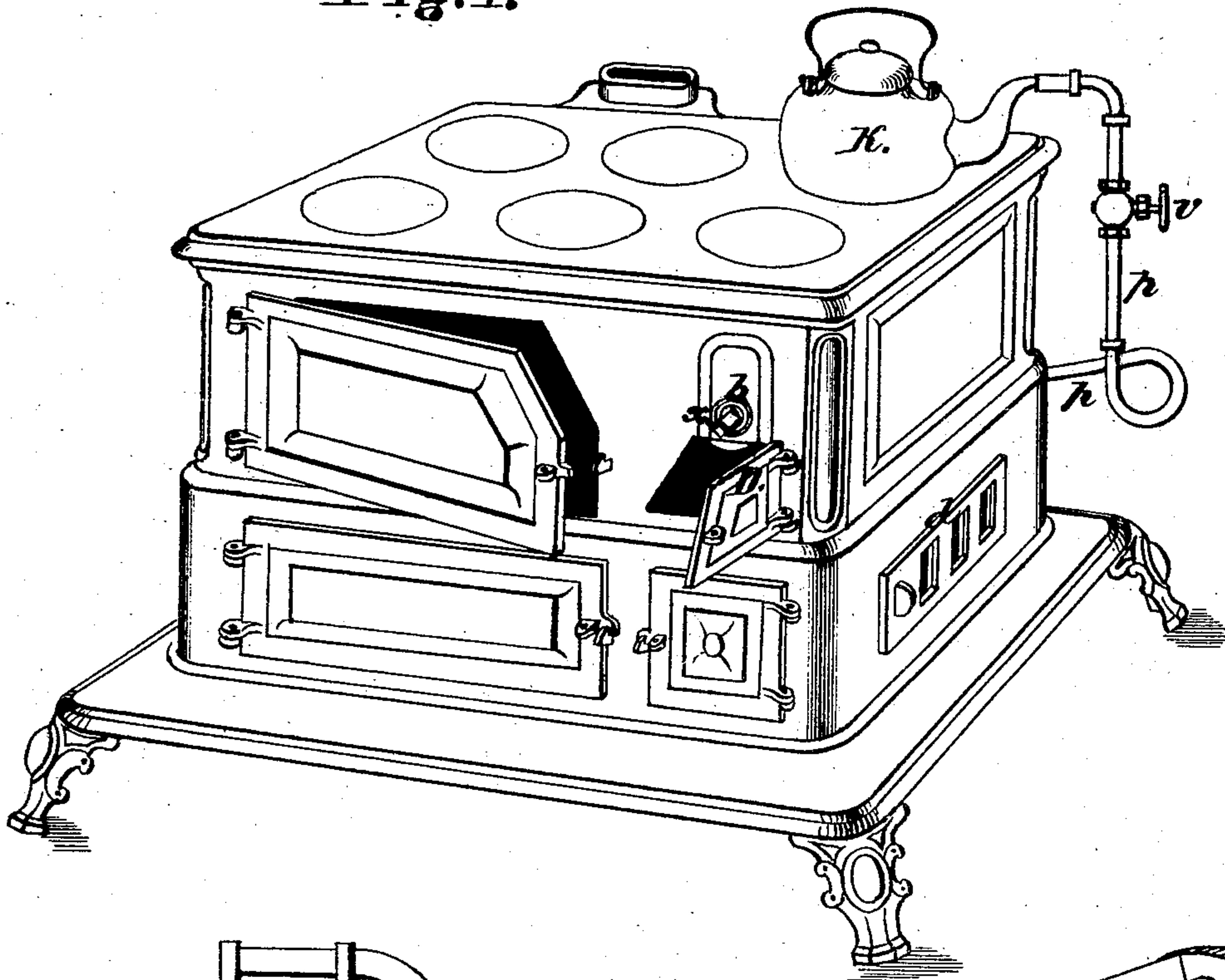


Fig. 3.

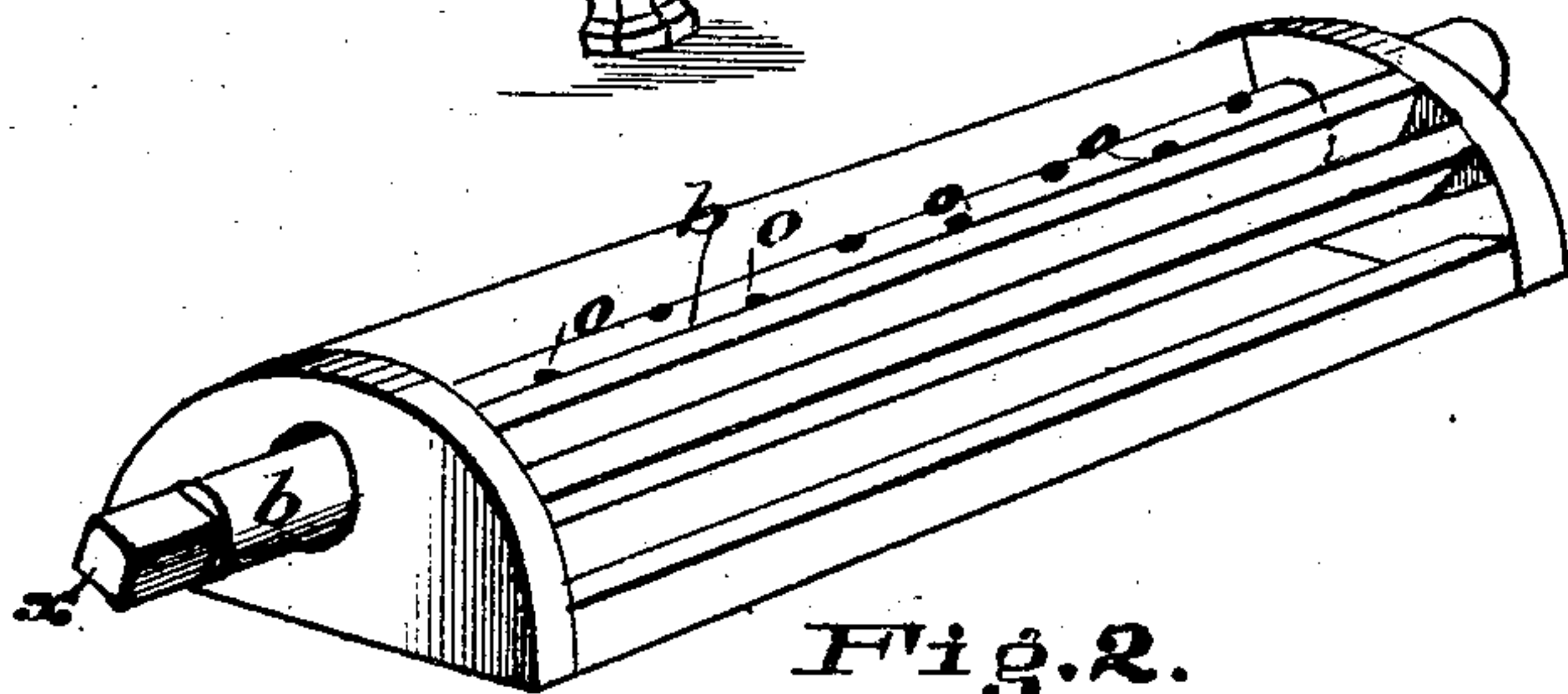
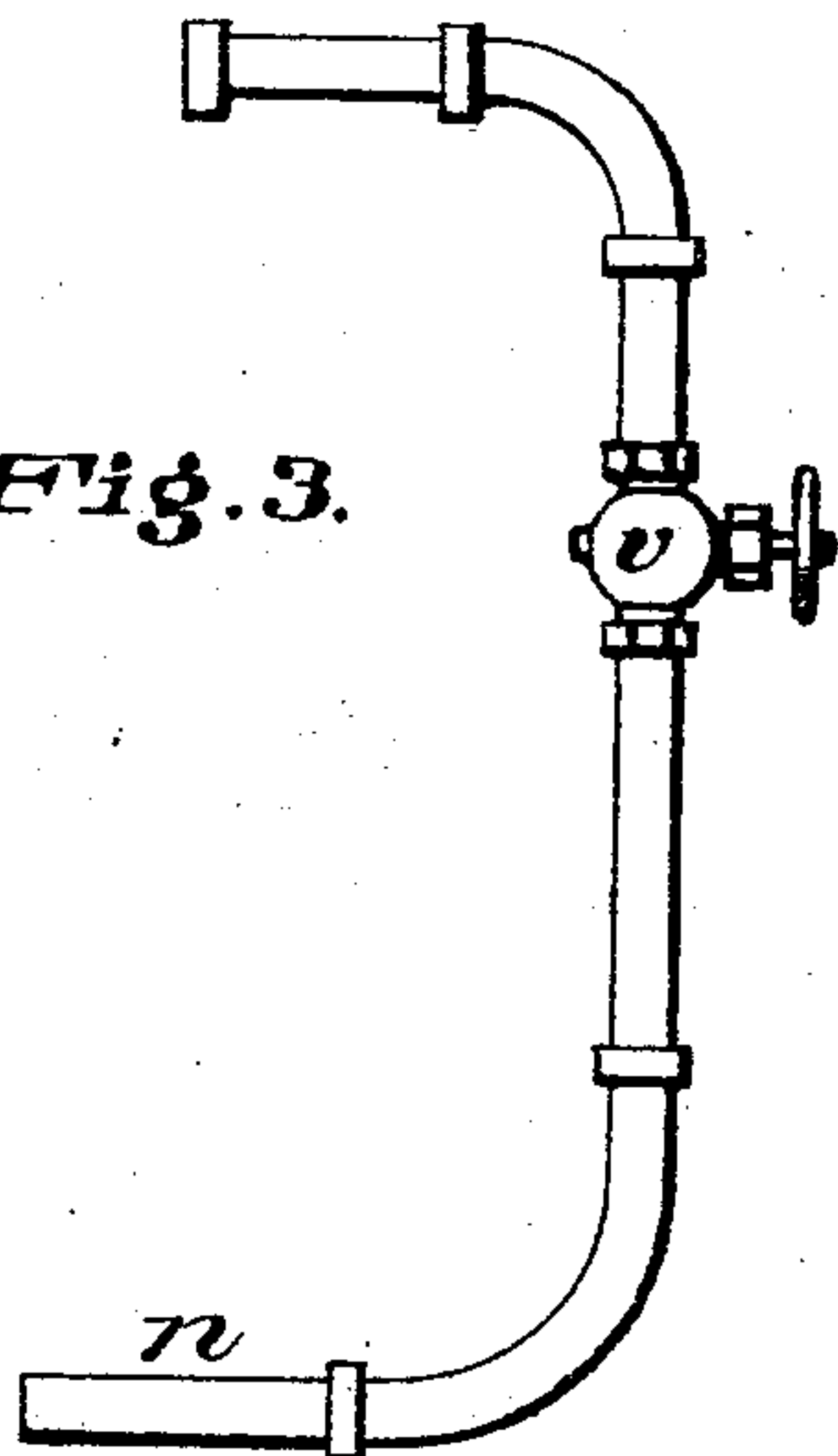
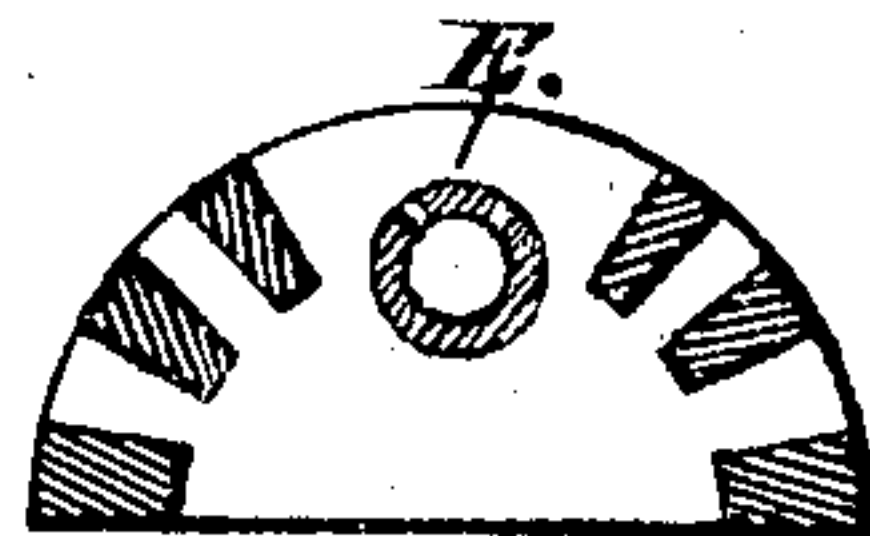


Fig. 2.

Fig. 4.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN MODES OF BURNING WATER FOR FUEL.

Specification forming part of Letters Patent No. 157,011, dated November 17, 1874; application filed May 2, 1873.

*To all whom it may concern:*

Be it known that I, HORACE T. LOVE, of the city and county of Providence, in the State of Rhode Island, have invented a Mode of Burning Water for Fuel, of which the following is a specification:

To burn water for fuel, I convert the water into steam, superheat the steam, divide and commingle the steam with air heated not less than 212° Fahrenheit, and, by the heated air, carry the superheated steam into ignited coals or other fire, to be therein decomposed into oxygen and hydrogen to become flame and to support the combustion.

The water-burning apparatus, made as simple as may be, to illustrate my invention, shows, in the accompanying drawings, water-boiler *k*, Figure I, having lid to be loaded by weight, Fig. IV, to force steam through leader, Fig. III, into steam-superheater *b*, Fig. II, and also to allow said lid to be a steam-escape or sort of safety-valve, when, by valve *v*, Fig. III, steam is shut out of superheater; valve *v* also, to regulate flow of steam, to prevent superheater being surcharged and cooling down below red heat. Fig. II shows a fire-grate for a stove shown in Fig. I.

It is very obvious that the form of the apparatus to be employed must conform, in general, to the shape of the water-burner. I do not intend, therefore, to restrict my invention to any particular form, it having respect to the disposition of the apparatus rather than to shape.

The superheater *b* I arrange in the fire itself, or against it, to secure the requisite degree of heat to the steam, or it would be ineffectual to burn as fuel. The steam-outlets *o* I dispose to deliver the steam outside of the fire-box, but in proximity to the bars, to secure its commingling with heated air, as the steam divides and diffuses itself by the mutual repulsion of its own heated particles. Without such commingling, or to commingle with cool air, would render it ineffectual for fuel.

The fire-grate I construct to swing outside of, and to turn over within, the fire-box, and to dump its ashes without disturbing the fire

within the box. This swinging keeps the fire-bars clear of ashes, and provides for keeping them hot, and for free ingress of the superheated steam, as it is commingled and carried by the air so heated into the incandescent coals to permeate the whole burning mass, to be decomposed and to flame. Without such preparation steam would be ineffectual for fuel.

If in some parts of the fire-box the fire is weak, as it generally is when first kindled, or if the coal is foul, or if other contingencies supervene unfavorable to the ready decomposing of the steam, to provide therefor, I take about one pound of common salt (chloride of sodium) to one hundred pounds of coal, if foul, or two hundred pounds, if clean, dissolve the salt in just enough water to wet the same, applying the solution in any convenient way.

Chlorine in fire will greatly facilitate the decomposing of steam in any case, and add greatly to the efficiency of the fire, and as it is both a combustible and a supporter of combustion, and as the heat of sodium, when exposed to water, is so intense that it will spontaneously take fire and burn with a flame, the salt will save on the expense of coal considerably more than its cost. When superheated steam is applied to refuse coal, siftings of coal-yards, or to cinders of coal-ashes, they will burn freely with great heat for a length of time if first washed in salt or sea water.

I have cut a screw-thread on the end *e* of the superheater *b* to turn it when constructed as one of the grate-bars, that the outlets *o o* shall be always on the side opposite the fire in the fire-box.

To realize the best results of my invention, I use about half as much coal as is consumed otherwise, and twice as much water as coal, both kindling and feeding fires with less coal than will smother the flame. Little other attention is needed through the day but to keep up the steam, regulating the heat by air-drafts *D* and *d*, Fig. I, and valve *v*, and keep the fire-bars free of ashes.

Some of the advantages of my invention are: More heat with less coal and cost; degree of heat for forges not otherwise to be attained;

fuel for steamships from the ocean with more room for freight and passengers; consuming coal-siftings and cinders; draft of stoves richer in oxygen to burn up poisonous oxide; and a more agreeable and healthy heat.

I disclaim in a water-burner any apparatus disposed outside of the fire, or not against it, to superheat the steam; or disposed to superheat in whatever way, if it commingle steam with air whose temperature is below that of steam, or 212° Fahrenheit; or however superheated, if it is disposed to throw or eject the steam directly into the fire, whether in jets or otherwise.

I claim as my invention—

The process of burning water for fuel by means of passing its steam through a red-hot superheater into a receiver of heated air, causing it to be divided and diffused therein, and commingled with the hot air to flow in a superheated and diffused state between the fire-bars into the burning coals, to be decomposed into oxygen and hydrogen, the hydrogen burning and the oxygen supporting the combustion.

HORACE T. LOVE.

Witnesses:

JAMES S. SMITH,  
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