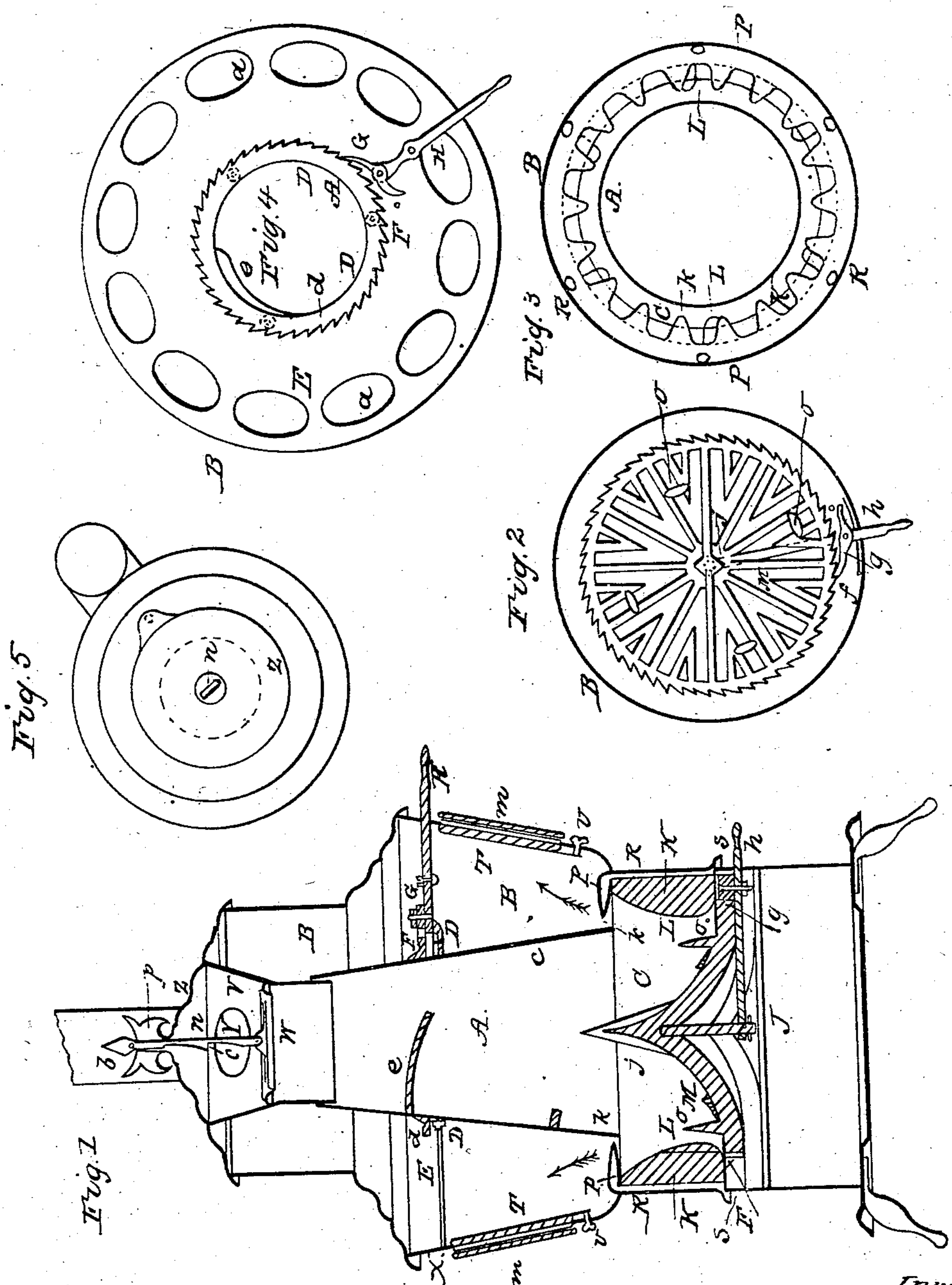


H. B. VAN BENTHUYSEN.

Magazine Stove

Patented Dec. 15, 1868.

No. 84,920.



Witnesses
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Letters Patent No. 84,920, dated December 15, 1868.

BASE-BURNING STOVE.

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, HENRY B. VAN BENTHUYSEN, of Emporium, in the county of Cameron, State of Pennsylvania, have invented certain new and useful Improvements in Coal-Stoves for burning bituminous coal, and consuming the gas and soot thereof; 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 accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical section of an entire stove, showing the arrangement of the internal parts.

Figure 2 is a top view of the conical rotary grate inside the casing, with the ratchet, dog, and lever.

Figure 3 is a top view of the fire-space and blower.

Figure 4 is a horizontal section, taken at *x*, showing the diaphragm-plate, the ratchet, dog, and lever, for rotating the internal cylinder, and also showing a spiral segment therein.

Figure 5 is a top view of the top plate and cover, and elbow for the smoke-pipe.

It is a well-known fact that, in many portions of the United States, bituminous coal is the cheapest fuel to be obtained. The use of this coal for domestic purposes, however, has hitherto been very objectionable, in consequence of the imperfect construction of the stoves in use, and the consequent imperfect combustion produced by them, which liberate and allow the escape of a large amount of carboniferous matter—gas and soot—thereby clogging the pipe and flues, and otherwise causing much annoyance and discomfort, besides the large waste of fuel.

Another serious difficulty in the use of bituminous coal for fuel is its tendency to expand when heated, melt together in a mass, choke the draught, and clog the stove.

The purpose of my invention is to overcome this difficulty, and to remove the most serious objections to this kind of fuel, economize the coal, and make its substance available, by producing a more perfect combustion, consuming the gas and soot.

My stove is constructed for heating-purposes, adapted to parlors, chambers, offices, and other places requiring artificial heat.

I am aware that base-burning stoves for anthracite coal have been constructed, and are in use for heating-purposes, but they are adapted exclusively to that kind of fuel, and in them bituminous coal cannot be used.

I am not aware that any base-burning stove has been so constructed as to adapt it to the use of bituminous coal.

The nature of my invention consists in constructing and adapting a base-burning stove to the especial use of bituminous coal for fuel, which I construct substantially as follows, viz:

With an internal cylinder, A, for the reception of coal, and an external casing, B, surrounding the internal

cylinder, and enclosing a space, for the passage of the results of combustion.

The internal cylinder is made conical in shape, with the large end downwards, so as to allow the coal to descend freely to the fire-space C; and, to secure this object, I suspend the cylinder by an encircling-flange, *d*, resting on friction-rollers D D, secured in a central plate or diaphragm, E, which encircles the cylinder, and is secured to the outer casing, and is perforated at *a*, for the draught, and to direct the heat towards the radiating-surface.

The flange *d*, which encircles the cylinder, and is securely attached to it, has its periphery formed into a ratchet, F, which is operated on by the dog G and lever H, or other equivalent device, whereby the cylinder is caused to rotate, and loosen the coal it contains; and, to force the coal downwards, I use spiral-like segments, *e e*, securely attached to the inner surface of the cylinder, and, by rotating the cylinder, the mass of coal is separated, and forced towards the grate M.

The portion of the casing below the cylinder, used for the fire-space C, I line with fire-brick, K, or iron, in the usual manner, to protect it from the direct action of the heat.

I make this lining with a series of vertical projections or ribs, L L, on the inner surface, to prevent the body of coal rotating with the grate.

Below the fire-space, I use a conical rotary grate, M, constructed to move in the opposite direction from the cylinder A.

I make the grate curved and cone-like, crowning upwards, with a spear-like projection, *j*, on the centre, penetrating the body of coal, for the purpose of breaking the mass asunder, when the grate and magazine-cylinder are moved in opposite directions.

Also, on the surface of the grate towards its rim, I place a series of spirally-arranged vertical projections, *o o*, to operate, in connection with the ribs L L, around the fire-space.

The periphery of the grate is formed into a ratchet, *f*, which is acted upon by the dog *g* and lever *h*, in order, by its rotary motion, to break up the coke in the fire-space, and the ashes caused more effectually to pass, through the grate, into the ash-pit, J, beneath.

Above the fire-space, directly on the upper end of the lining, I place an air-chamber or blower, P, the inner rim of which is corrugated, and formed into a series of tuyeres, *k k*, opening into the centre of the flame, above the burning coal, for the purpose of introducing an additional supply of oxygen, to combine with the free carbon, and complete the combustion before the volatile matters escape into the pipe.

The blower is supplied with air by a series of air-passages, R R, passing downwards between the lining and outer casing, and opening to the surface at S.

In the outer casing above the fire-space, and below

the diaphragm, I insert a series of mica windows, *m m*, arranged in the common manner.

Inside of these windows, I arrange sliding plates, *T T*, to cover and protect the micas from discoloration, when a fire is in process of kindling, or when the radiation of light is not desirable, and save them from continual wear when not needed.

When the fire burns clear, and the radiation of light is desirable, the plates are easily shifted with the knobs *U U*, and the light of the fire freely emitted.

Attached to the top plate of the stove, extending downwards, and entering the internal cylinder, I use a funnel, *V*, through which the coal is conveyed to the magazine-cylinder, the lower end of the funnel being large enough to quite fill the opening in the upper end of the cylinder, and yet allow the cylinder to move around it without friction.

The funnel is closed with a close-fitting lid, *W*, to prevent the escape of any volatile matter upwards.

Above the lid, in the back part of the funnel, I make an opening, *Y*, for the escape of smoke or volatile matter, when the lid is raised for the purpose of kindling the fire, or for the introduction of fuel.

I remove or elevate the lid by a rod, *n*, attached to it, and passing up through the centre of the cover *z* and ornament *p*, and entering the knob *b*, to which it is secured.

By lifting with the knob, the lid can be raised into the concave of the cover *z*, and retained in that position by a notch, *c*, in the rod *n*, and the cover swung to one side, when fuel is to be added.

I do not limit myself to any particular device for rotating the magazine-cylinder and the conical grate, although I now adopt the ratchet, dog, and lever. I am aware that a rotary motion can be produced by means of a rack and pinion, a worm-gear, or other device. Nor do I confine myself to any particular arrangement of the projecting pieces on the inside of the magazine; nor to any particular arrangement of the projecting ribs on the inner surface of the fire-space. Nor do I limit myself to any particular arrangement of the projections on the upper surface of the grate; but

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

1. A rotating inside cylinder-magazine, with or without projections on the inner surface, substantially as described.

2. Also, the ratchet, dog, and lever, or other equivalent device, in combination with the rotary magazine, substantially as and for the purposes described.

3. Also, a cone-like rotary grate, provided with vertical projections on its surface, as above described.

4. Also, the projecting ribs on the inner surface of the fire-space, in combination with the vertical projections on the rotating grate, substantially as and for the purpose set forth in the foregoing specification.

HENRY B. VAN BENTHUYSEN.

Witnesses:

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