J. F. McKENNEY.

Steam-Heater.

No. 167,186. Patented Aug. 31, 1875.

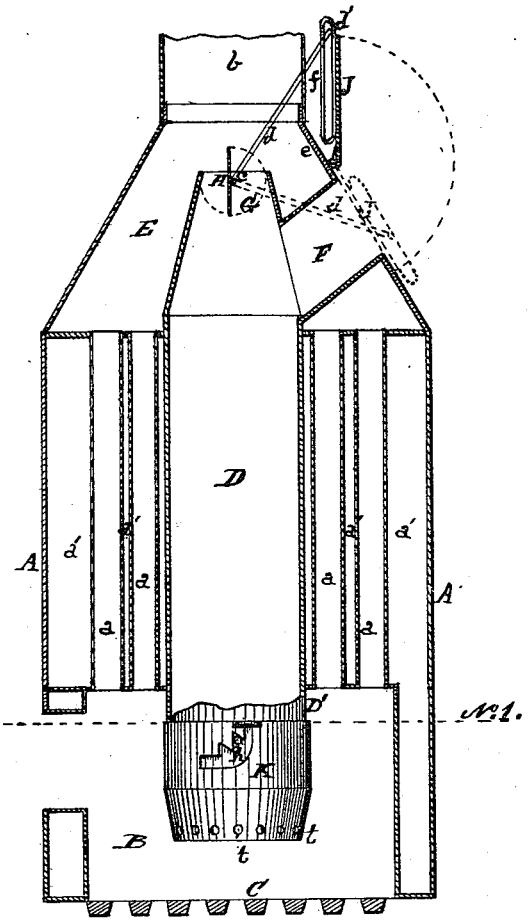

Fig. 1.

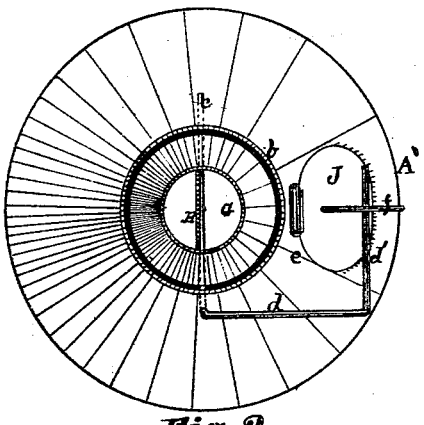

Fig. 2.

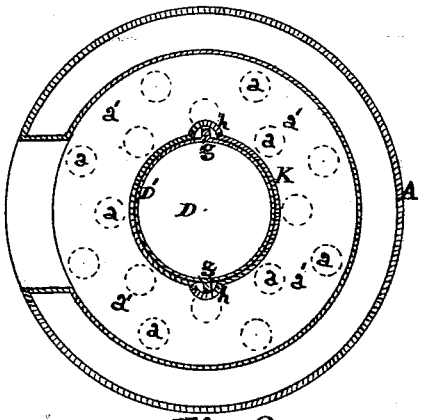

Fig. 3.

Witnesses { Wm. Jas. Vile
James Conna

James F. McKenney
by his Atty Alex. Sellkirk
Inventor.

UNITED STATES PATENT OFFICE.

JAMES F. McKENNEY, OF AMSTERDAM, NEW YORK.

IMPROVEMENT IN STEAM-HEATERS.

Specification forming part of Letters Patent No. **167,186**, dated August 31, 1875; application filed June 29, 1874.

To all whom it may concern:

Be it known that I, JAMES F. McKENNEY, of Amsterdam, county of Montgomery, State of New York, have invented certain new and useful Improvements in Steam-Generators for Heating Purposes; and I do hereby declare that the following is a description thereof, reference being had to the accompanying drawings forming a part of this specification, in which—

Figure 1 is a sectional elevation of the generator embodying the improvements in this invention. Fig. 2 is a view from above of the upper end of the generator and the improvements. Fig. 3 is a sectional view taken at horizontal line No. 1 in Fig. 1.

My invention relates to that class of steam-generators having a fuel-reservoir for supplying fuel to the fire-chamber; and consists in the combination, with the vertical flues passing through the water-space from the fire-chamber, the dome-chamber, and the fuel-reservoir surrounded by the said water-space, of a gas-receiving chamber communicating with the said reservoir, and above the same and the top of the boiler proper, and a valve operated through the medium of the door of a side passage leading to the reservoir, in such a manner that the said gas-receiving chamber will be inclosed by the dome-chamber, and become highly heated by the hot gaseous products of combustion drawn by the draft up from the fire-chamber through the flues of the boiler and the dome-chamber to the exit-flue, and the gases within be raised to a high temperature, and held above the fuel-reservoir proper by its rarefaction for immediate escape to the exit-flue above, when the said valve is turned open.

The object of this invention is to collect the gas rising within the fuel-reservoir, and hold the same at a point above the entrance of the opening to said reservoir, through which the fuel is received, and immediately beneath the draft-flue, and in close proximity with the same, that it may immediately escape to the exit-flue when the valve is turned open, and before fresh air can find a passage within when the door of the reservoir is opened.

To enable others skilled in the art to make and use my invention, I will proceed to describe it in reference to the drawings and letters of reference marked thereon, the same letters indicating like parts.

In the drawings, A represents the boiler proper, constructed in any of the known ways practiced by the trade, and provided with the vertical flues *a a*, passing through the water-space *a'*, and leading from the fire-chamber B into the dome-chamber E, through which flues the hot gaseous products of combustion are drawn by the draft to enter the said dome-chamber, and thence to the exit-flue *b*. C is the grated fire-bed. D is the fuel-reservoir, the walls of which are made steam-tight, and is surrounded by the water-space of the boiler, so that none of the hot gases may in their passage contact with the walls of the said reservoir, and highly heat the contents therein, to cause a disengagement of the gases from the fuel, as in base-burning stoves, where the hot gases circulate around and in contact with the walls of their reservoirs. The lower end of the fuel-reservoir is extended downward to a short distance within the fire-chamber, and is provided with an adjustable discharge end, K, supported from lugs *g g*, cast solid with the said lower extended end, and working into the oblique step-shaped slots *h*, made in the shell of the said adjustable piece, by which arrangement the said adjustable discharge end may be variously raised or lowered on the extended end D' of the reservoir in relation to the grate C, to produce a greater or less depth of fuel on the bed of the same.

Above the fuel-reservoir, and communicating with the same, is made a gas-receiving chamber, G, which projects above the top of the boiler proper and into the dome-chamber, which completely surrounds it. The upper end of the said receiving-chamber is closed by a valve, H, which valve is operated by the door J of the chute or branch F of the fuel-reservoir through the medium of the shaft *c*, on which the valve turns, lever *d* and arm *d'* working in the loop *f* of the door J. Other devices may be employed as a means through which the said door may be made to operate the said valve, as no particular device for such operation is claimed by me, as I would modify the same in its parts as circumstances might demand, yet not in such a manner as

to render the said door incapable of operating the valve to open it when the said door is being opened, and to close the same when the door is being closed.

Steam-boilers having fuel-reservoirs to supply fire to the fire-chamber are old, having long been known, and a space in the upper portion of a fuel-reservoir provided with damper or register-valve is also old, as is also a device for operating the said register-valve by the movement of a door or cover of the branch or chute F of the reservoir, none of which do I claim as forming a part of this invention.

It will be observed that in my improved steam-generator the fuel-reservoir proper extends only up to the branch, and not above the boiler proper, and that its body is entirely surrounded by the water-space of the boiler, so that none of the hot gases drawn from the fire-chamber can come in contact with the walls of the reservoir to heat the same and the fuel within, and thereby generate gas, as in base-burning stoves, where a valve and space have been made with the upper portion of the reservoir employed. It will be also observed that the dome of the reservoir is conical in form, and incloses a chamber receiving all the hot gaseous products drawn through the boiler-flues, and that the receiving-chamber for the gases rising up in the reservoir is surrounded by the dome-chamber, and also rises up within the same immediately beneath the exit-flue, and the valve-closed end is in close proximity with the entrance to the said flue. It is evident that as the body of the fuel-reservoir cannot be highly heated, so as to generate any gas from the fuel within, the gas arising must be that generated at the discharge end of the fuel-reservoir projecting down into the fire-chamber, and not drawn from the said discharge end by the draft through the boiler-flues. By the provision of the gas-receiving chamber above the fuel-reservoir proper, and within the highly-heated dome-chamber, with its valve end near to and beneath the exit-flue, all the gas rising up into the reservoir will be gathered, by reason of their high rarefaction, in the said receiving-chamber at a point above the fuel and the chute or branch, and will be held in readiness, in close proximity to the entrance to the exit-flue, for discharge into the same before any fresh air is permitted to enter through the chute when the door of the same is opened.

By the improvements in this invention the gas gradually accumulating in the reservoir in the intervals between its being charged with fuel is prevented from seeking an escape through the chute or branch of the reservoir by its being held in a highly-rarefied state at a point above the same, and in a condition of situation which will prevent any explosion into the room, and admit a full escape to the exit before fresh air is introduced when the door is opened.

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

In a steam-generator, the gas-receiving chamber G, provided with the valve H in its upper end, and projected upward within the dome-chamber above the boiler proper and beneath the exit-flue, to be heated by the hot gases drawn from the fire-chamber through the boiler-flues, in combination with a fuel-reservoir surrounded by a water-space, and provided with a lateral branch or chute covered by a door, whereby the gases generated from the fuel in the discharge end of the reservoir may be received and rarefied above the branch, and be there held by its rarefaction, for a ready discharge to the exit-flue above when the said valve is opened, substantially as and for the purpose set forth.

JAMES F. McKENNEY.

Witnesses:
JOHN H. CAIRN,
MELLVILL VAN WORMER.