(No Model.)

J. B. DAVIDS.

METHOD OF PROMOTING COMBUSTION IN FURNACES.

No. 519,325. Patented May 8, 1894.

Fig. 1.

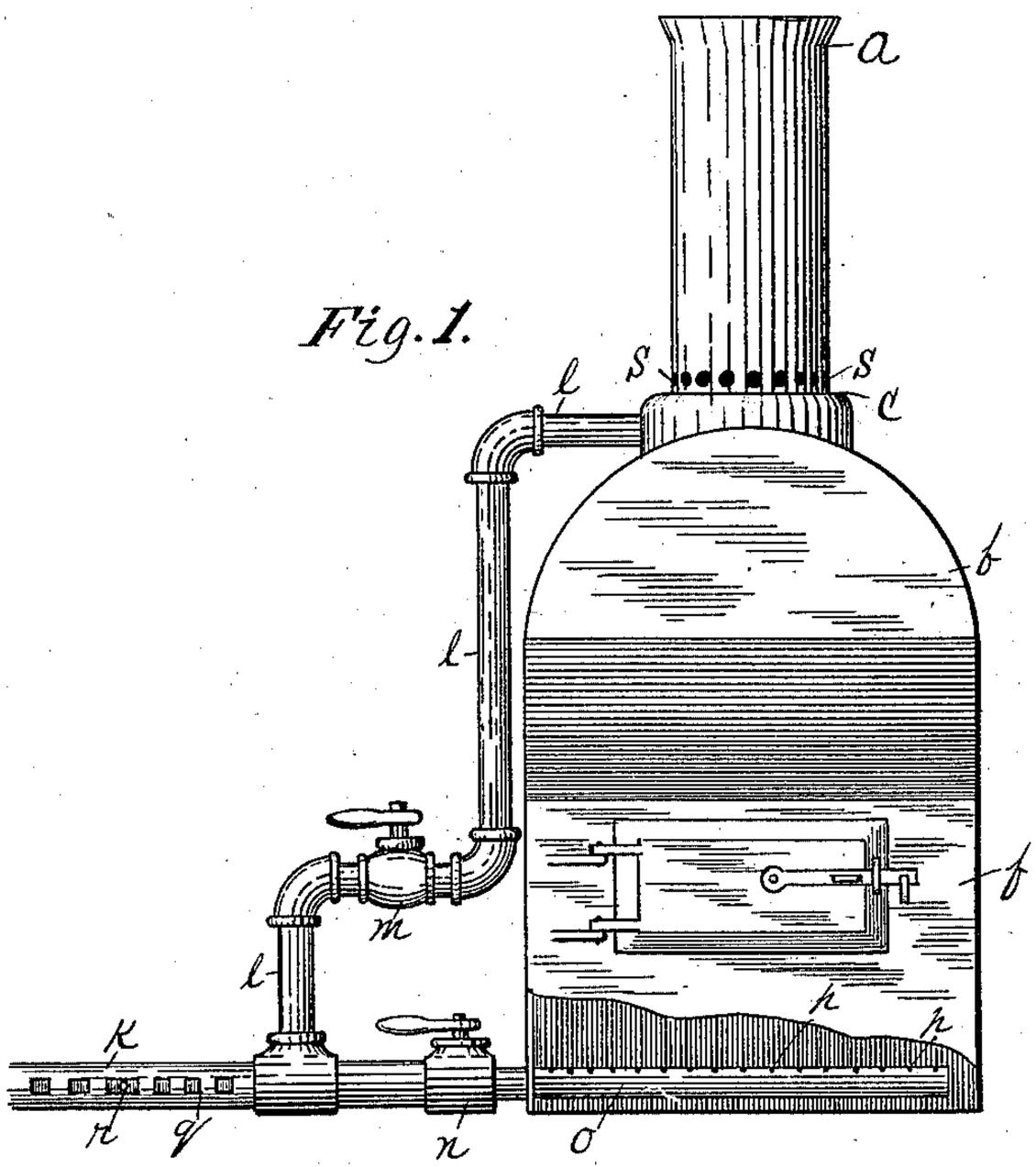
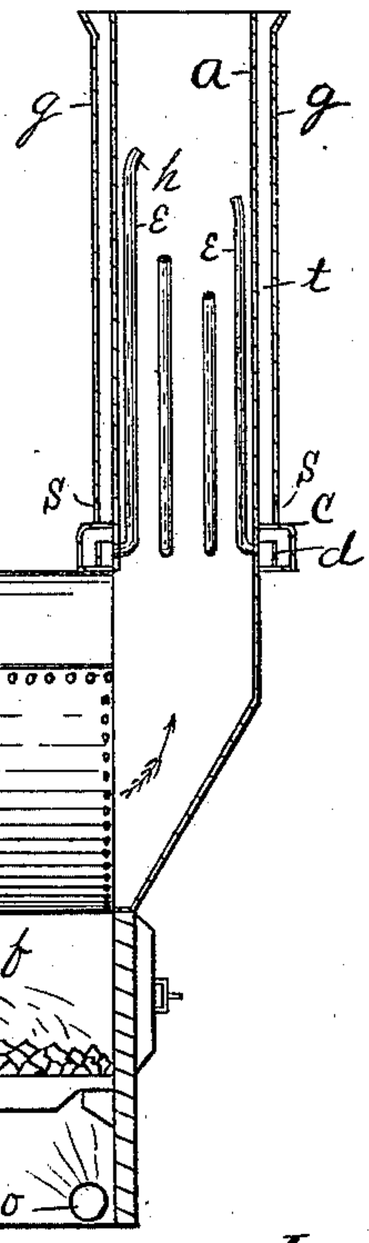
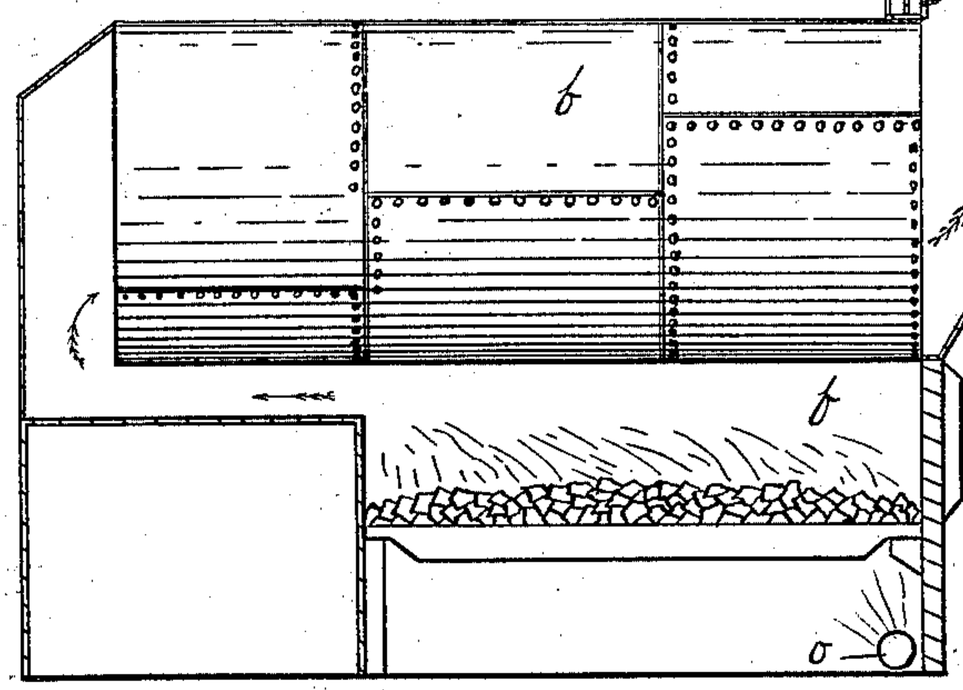


Fig. 2.





Witnesses
Fred A. Mason
C. O. Mason

Inventor
John B. Davids
by F. W. Mason
atty.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN B. DAVIDS, OF DARTMOUTH, MASSACHUSETTS, ASSIGNOR TO E. M. CHISHOLM DAVIDS, OF SAME PLACE.

METHOD OF PROMOTING COMBUSTION IN FURNACES.

SPECIFICATION forming part of Letters Patent No. 519,325, dated May 8, 1894.

Application filed April 29, 1893. Serial No. 472,391. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. DAVIDS, a citizen of the United States, residing at (North) Dartmouth, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Methods of Promoting Combustion in Furnaces, of which the following is a specification.

This invention relates more particularly to methods of promoting combustion, under the boilers of steam vessels. The method ordinarily employed, of promoting combustion under such boilers, is to construct the fire room, so that it can be tightly closed, and forcing air into said room, and then through the fire, in such quantity as to give the required combustion. This method, makes it impossible for the firemen to sustain life in such room, longer than a few minutes at a time, on account of the condensed air and the great heat.

The object of this invention, is to render the firing of such boilers, more endurable, and less risky to the lives of the firemen.

The accompanying drawings illustrate my invention, in which—

Figure 1 represents a front elevation of a smoke stack, boiler, and fire-box, provided with my improvements, and having a portion of the fire-box broken away, to more fully show a portion of the construction. Fig. 2. represents a side elevation of the same showing the smoke stack and fire-box in perpendicular longitudinal section.

Similar letters refer to similar parts in both the views.

a, represents a smoke stack to a boiler having an air-tight chamber *c*, around the outside of its base.

d, represents a circular partition, secured to the bottom of the chamber *c*, and extending nearly to the top of said chamber.

e, represents tubes of varying lengths which are secured in that portion of the wall of the smoke stack inclosed by the chamber *c*, and extend upward along the inside of the same; preferably having their ends *h*, inclined inward toward the center of the flue.

g, represents a pipe, resting on the chamber *c*, and provided with the holes *s*, near its base, and sufficiently large in diameter, to leave an air-space *t*, between it and the outside of the smoke stack.

k, represents an air pipe, leading from an air-pump or air-reservoir, (not shown) and having its end *o*, projecting under the grate of the fire-box *f*, where, it is provided with a series of perforations *p*.

l, represents an air-pipe, branching from the pipe *k*, and leading into the chamber *c*. The pipe *l*, is supplied with the valve *m*, and the pipe *k*, is supplied with the valve *n*, located between the junction of the pipes *k*, and *l*, and the fire-box *f*. The pipe *k*, is further supplied with the openings *q*, which are adapted to be closed by the slide *r*.

In operation, air is forced through the pipes *k*, and *l*, by an air pump or other suitable means. The air which passes through the pipe *l*, enter the chamber *c*, and passes thence into the tubes *e*, and out, at their upper ends. The strong blast of air, issuing from the upper ends of the tubes *e*, causes a partial vacuum below them, which the air, still below, rushes to fill, and thus a strong upward current of air is created in the stack, and a strong draft is obtained. The draft is further assisted by the air issuing from the perforated end *o*, of the pipe *k*. When coal is added to the fire, the blast from the perforation *p*, is shut off by the valve *n*, in order to prevent the flames from issuing from the door of the fire-box. When no increased draft is desired, the valves *m*, and *n*, are both closed.

When my improvement is used in connection with the boilers of a steam vessel, the openings *q*, in the pipe *k*, may be opened, so as to admit a supply of air to the bottom of the fire room, and thus materially lessen its temperature.

The circular partition *d*, serves to distribute the air entering the chamber *c*, from the pipe *l*, equally, to all the tubes *e*.

I claim—

In combination with the fire-box and smoke stack of a steam boiler, the pipe *k*, leading from an air reservoir containing air under pressure, and having openings *q*, opening into the fire room adapted to be closed by a slide *r*, and having the branch *o*, provided with the

valve *n*, and perforations *p*, extending into the fire box under the fire; and having the branch *l*, provided with the valve *m*, extending into the chamber *c*, surrounding the base of the smoke stack; whereby the blast of air through said pipe, may be directed wholly below the fire, or wholly into the smoke stack, or wholly into the fire room, or divided between said points, or shut off from any or all of said points, as and for the purpose specified.

JOHN B. DAVIDS.

Witnesses:
H. W. MASON,
JAMES C. HITCH.