(No Model.)

S. R. CROWNER.

STEAM GENERATOR.

No. 407,469. Patented July 23, 1889.

Fig. 1

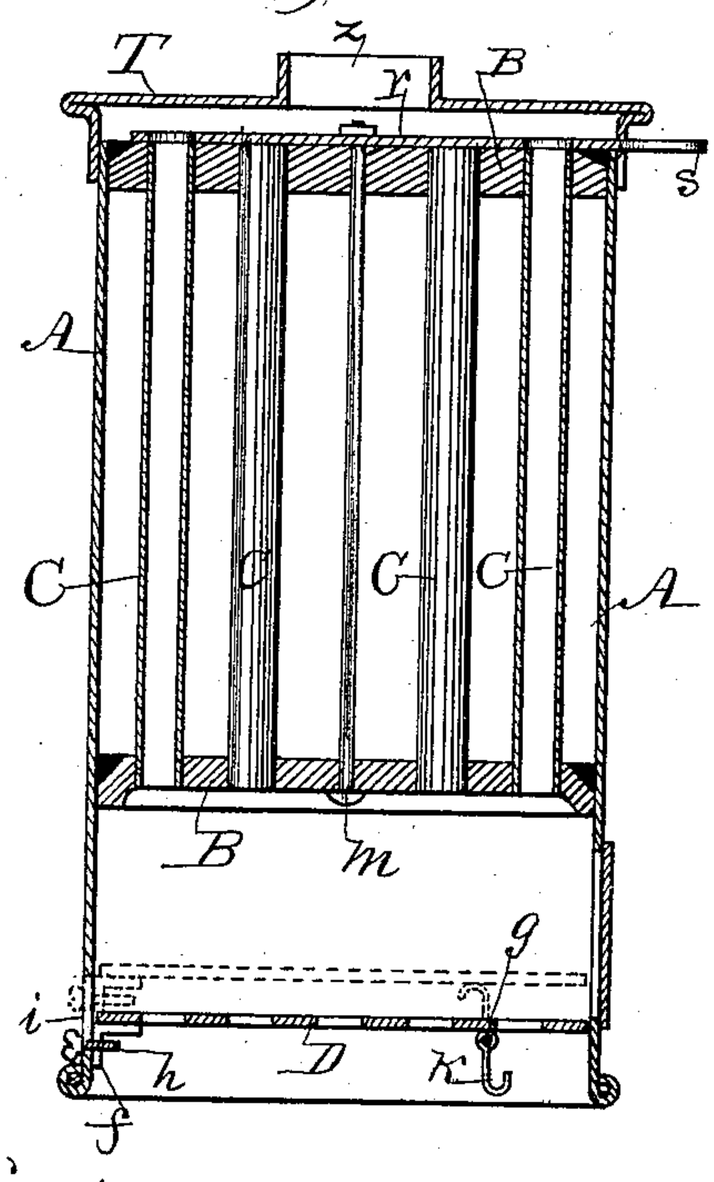


Fig. 2

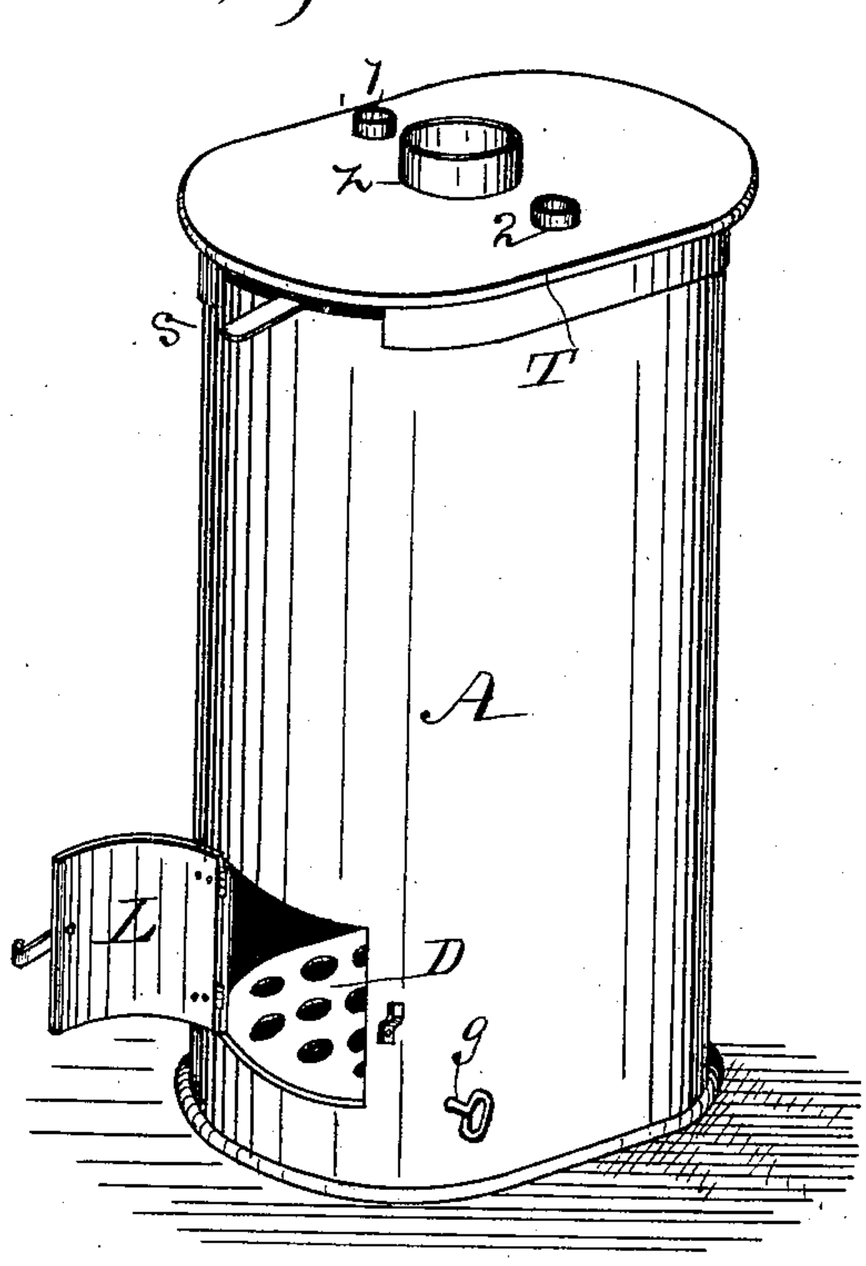


Fig. 4

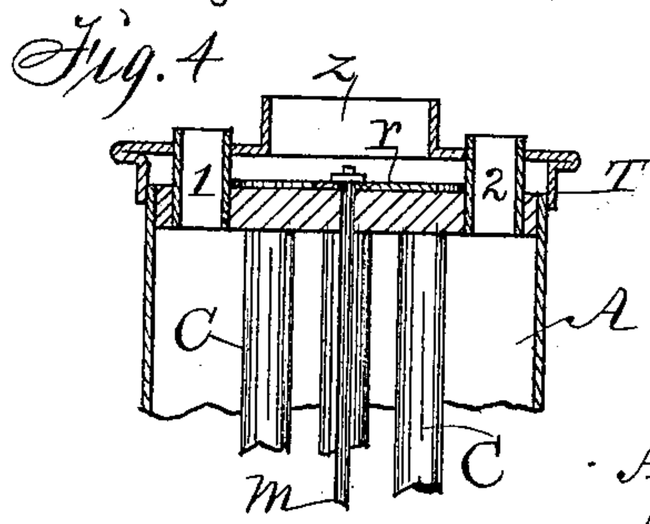
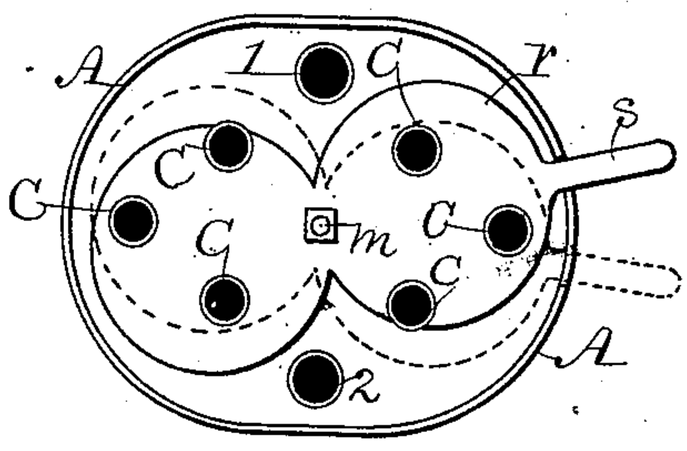


Fig. 3



Witnesses:
M. P. Smith.
E. H. Sues.

Inventor:
States R. Crowner,
By Thomas G. Orwig, Attorney.

UNITED STATES PATENT OFFICE.

STATES R. CROWNER, OF NEWELL, IOWA, ASSIGNOR OF ONE-HALF TO W. J. MILES, OF SAME PLACE.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 407,469, dated July 23, 1889.

Application filed March 11, 1889. Serial No. 302,870. (No model.)

To all whom it may concern:

Be it known that I, STATES R. CROWNER, a citizen of the United States, residing at Newell, in the county of Buena Vista and State of Iowa, have invented an Improved Steam-Generator, of which the following is a specification.

My object is to provide a portable steam-generator in which wood or coal may be alternately and advantageously used; and my invention consists in the construction and combination of a furnace and a boiler, as hereinafter set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view showing the construction of the boiler and mechanism for supporting and adjusting the furnace-grate. Fig. 2 is a perspective view of the complete generator. Fig. 3 is a sectional view of the top portion, showing the induction and eduction ports of the boiler and the furnace-damper. Fig. 4 is a sectional view showing the ports.

A is the wall of the boiler and furnace made in the form of an open-ended cylinder from sheet metal. It is preferably oval-shaped in its cross-section and may vary in length and diameter, as desired.

B are cast-metal plates corresponding in shape and size with the wall A. They have coinciding perforations, through which the ends of open-ended tubes C are passed and fastened by expanding their extremities in a common way.

The edges of the plates B are beveled on their tops to produce annular spaces that can be filled with cement to produce steam-tight joints when they are placed inside of the wall A, as shown in Fig. 1, and fixed to the wall by means of screws, as required, to produce a boiler through which the products of combustion can pass upward from the furnace-chamber under the boiler.

D is a furnace-grate supported upon an adjustable bracket *f* and a rock-shaft *g*. The bracket is clamped fast to the inside of the wall by means of a screw *h*, that extends through a vertical slot *i* in such a manner that it can be raised or lowered. The rock-shaft *g* has projections *k*, that can be turned upward to support the grate at a higher point, as indicated by dotted lines in Fig. 1, and as required, to adapt the furnace for burning coal advantageously in place of wood.

L represents a door through which fuel is passed and placed upon the grate.

m is a rod that extends up through perforations in the centers of the plates B, and is fastened by means of a nut on its end.

r is a multiple damper adapted in shape to simultaneously open and close the top ends of the tubes C, as required, to regulate the draft of the furnace. It is pivoted to the top of the rod *m*, and has a handle *s*, that extends out through a slot in the flange of the cover T, fitted to the top of the boiler-wall A.

z is a smoke-flue at the center of the cover.

1 and 2 are short open-ended tubes fixed in the top plate B, to extend through the cover T, to serve as induction and eduction ports, through which water can be introduced and steam ejected to be conveyed by means of suitable tubing to a vessel for cooking feed, heating water, or any other purpose desired.

I am aware open-ended tubes have been extended from a furnace-chamber through a boiler to convey products of combustion, and a damper connected with the top ends of the tubes; but my manner of combining two plates, open-ended tubes, a multiple damper, and a cap or cover through which short open-ended tubes project, with the wall of a boiler-furnace, is novel and advantageous.

I claim as my invention—

1. The adjustable bracket *f*, and the rock-shaft *g*, having projections *k*, in combination with the furnace and boiler-wall A, for the purposes stated.

2. In a steam-generator, the combination of the multiple damper *r*, with the boiler composed of the plates B, tubes C, and wall A, by means of the rod *m*, substantially as shown and described, for the purposes stated.

3. A steam-generator comprising a sheet-

metal wall having a grate in its bottom portion, a perforated plate at some distance above the grate, a perforated plate at its top, a series of tubes extending from the lower perforated plate to the upper, a multiple damper pivoted on top of the upper plate by means of a rod that binds the two perforated plates together, a cover fitted to the top, and two open-ended tubes extended through the cover and the upper perforated plate, arranged and combined substantially as shown and described, for the purposes stated.

STATES R. CROWNER.

Witnesses:
P. H. JUDGE,
F. C. WEBSTER.