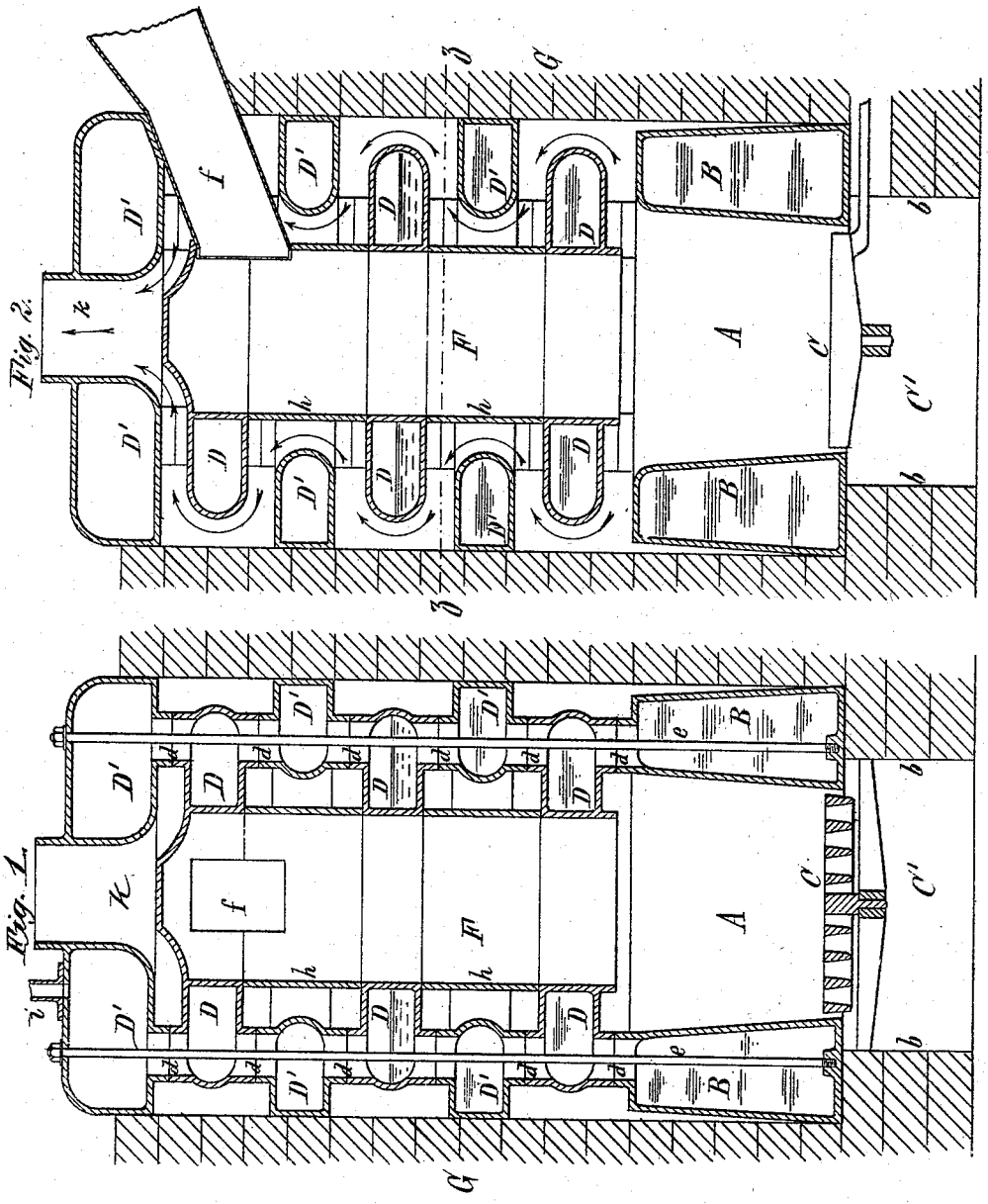
2 Sheets—Sheet 1.

M. B. BUELL.

SECTIONAL STEAM GENERATOR.

No. 182,640. Patented Sept. 26, 1876.



Witnesses

Charles J. Buchheit

C. N. Woodward

Morris B. Buell Inventor

by Edward Wilhelm, Atty

2 Sheets—Sheet 2.

M. B. BUELL.

SECTIONAL STEAM GENERATOR.

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Fig. 3.

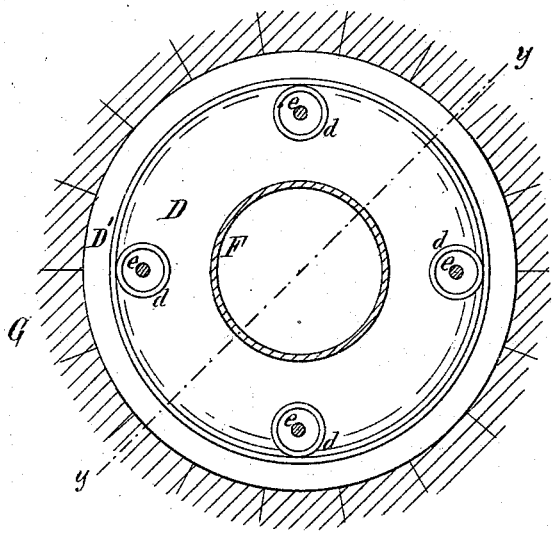
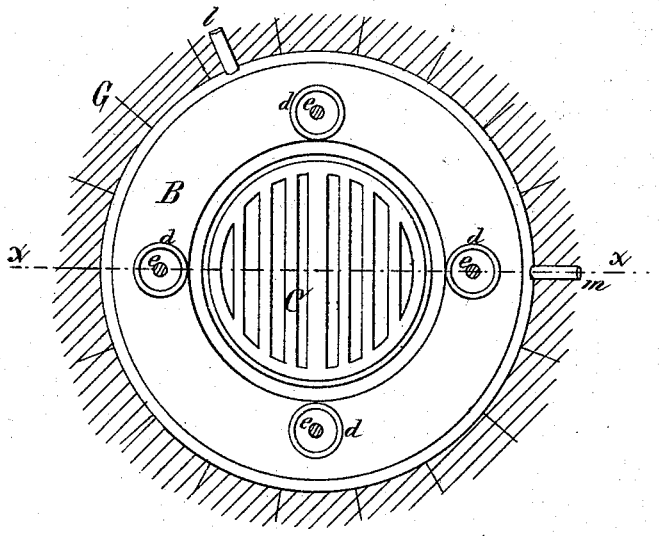


Fig. 4.



Witnesses
Chas. J. Buckheit
E. H. Woodward

Morris B. Buell Inventor
by Edward Wilhelm, Atty.

UNITED STATES PATENT OFFICE.

MORRIS B. BUELL, OF DUNKIRK, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO H. C. BRUNDAGE, OF SAME PLACE.

IMPROVEMENT IN SECTIONAL STEAM-GENERATORS.

Specification forming part of Letters Patent No. **182,640**, dated September 26, 1876; application filed February 7, 1876.

To all whom it may concern:

Be it known that I, MORRIS B. BUELL, of Dunkirk, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Steam-Generators, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

My invention relates to an apparatus designed to generate steam under a low pressure for heating purposes, and composed of a cylindrical water-space surrounding the fire-pot, and a number of annular water and steam spaces, arranged horizontally above the same, and connected by suitable pipes, as will be hereinafter more fully described.

In the accompanying drawings, Figure 1 is a vertical section of my improved steam-generator in line *x x*, Fig. 4. Fig. 2 is a similar section in line *y y*, Fig. 3. Fig. 3 is a horizontal section in line *z z*, Fig. 2. Fig. 4 is a top-plan view of the fire-pot and surrounding water-chamber.

Like letters of reference refer to like parts in each of the figures.

A represents the fire-pot; B, the water-chamber surrounding the same; C, the grate; and C′, the ash-pit. The water-chamber B is made in the form of a hollow ring, resting with its flat bottom upon the base supports *b* of brick or other suitable material, and having its sides slightly tapering upwardly to facilitate the casting of the chamber B, the latter being cast complete in one piece in an obvious manner. D D′ represent a number of annular water and steam chambers or hollow rings, arranged horizontally above the chamber B, one above the other, as clearly shown in the drawings. The rings D D′ and the chamber B on its upper side are provided with a corresponding number of hollow bosses or short pipes, *d*, fitting tightly upon each other, and forming communications between the different rings D D′ and the chamber B. The rings D D′ and chamber B are held together by vertical tie-rods *e* running through the pipe-connection *d*, the lower ends of the tie-rods being preferably screwed into a boss on the bottom of the chamber B, while the upper ends are secured by screw-nuts, as clearly shown in Fig. 1. F is a coal-magazine or feed-cylinder arranged centrally above the fire-pot, so as to be surrounded by the rings D D′, and *f* the feed-spout thereof, extending outwardly through the casing or brick-work inclosing the apparatus.

The rings or annular spaces D D′ are preferably made of unequal diameters, the ring D directly above the chamber B being made of such size as to fit snugly around the magazine F, while leaving an open space between its circumference and the inclosing case or brick-work G of the apparatus. The next higher ring D′ is made of larger diameter, so as to fit with its outside against the inclosing case G, leaving an open space between its inner surface and the magazine F. The next higher ring D is made of the same size as the first ring D, and the next following ring of the same size as the ring D′, and so on through the whole apparatus. By this arrangement of the rings D D′ the course of the products of combustion from the fire-pot upward will be somewhat like a reversed curve, as indicated by arrows in Fig. 2, touching the entire surface of the rings D D′, excepting the inner surface of the rings D and the outer surface of the rings D′. The rings D are preferably made round on their outside, and the rings D′ round on their inside, so that the reversal of the current of hot gases around the rings is rendered so easy as not to interfere with the draft. The rings D are made straight on their inner side, so that their inner walls may form part of the coal-magazine or feed-cylinder F, the walls of the magazine between the rings D being formed by interposed cylinders *h*.

The top ring D′ is preferably made somewhat higher than the rest of the rings, so as to form a steam-dome, from which the steam is taken by a pipe, *i*. *k* is the smoke-pipe, arranged centrally in the upper ring D′, and connected with the chimney in any suitable manner. *l* represents the feed-water pipe, and *m* the return-water pipe, tapping into the water-chamber B at any convenient point. The water-chamber B, being formed without any fuel-openings in its side, presents an unbroken surface to the direct action of the burn-

ing fuel, and is therefore better adapted to abstract the heat therefrom, and more readily constructed than a water-space provided with a fuel-opening.

The water-line may be placed at any desired height above the fire-pot. As shown in the drawings, it is arranged in the center of the third ring above the same.

The water and steam chambers B and D D′ and magazine F are readily constructed of cast-iron, the inclosing casing G being constructed either of metal or brick, as may be desired.

My improved steam-generator is very strong and compact, and constructed at comparatively small expense, and forms a very efficient generator, as the heat involved by the fuel is utilized therein to the utmost extent.

What I claim as my invention is—

The combination, with the chamber B, fuel-magazine F, and casing G, of the alternating smaller and larger horizontal rings D D′, so as to form a winding passage for the products of combustion, substantially as and for the purpose hereinbefore set forth.

MORRIS B. BUELL.

Witnesses:

MELVIN F. STEPHENS,

T. C. TAYLOR.