No. 773,420. PATENTED OCT. 25, 1904.

J. C. RAYMOND.

COMBINED STEAM GENERATOR AND GRATE.

APPLICATION FILED DEC. 17, 1903.

NO MODEL.

Fig. 1.

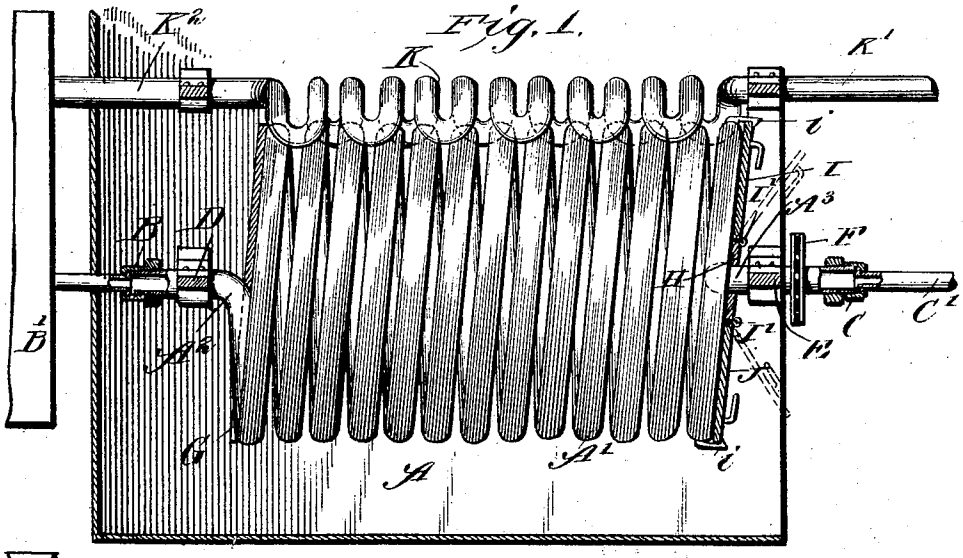


Fig. 2.

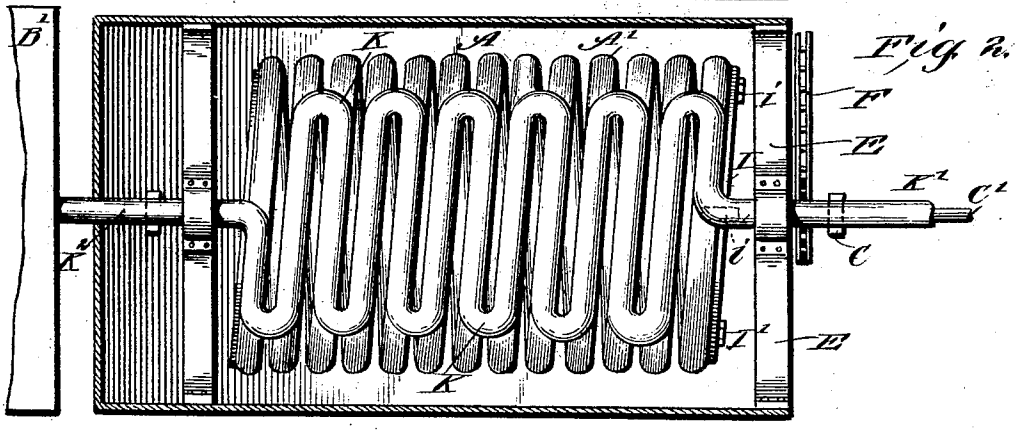
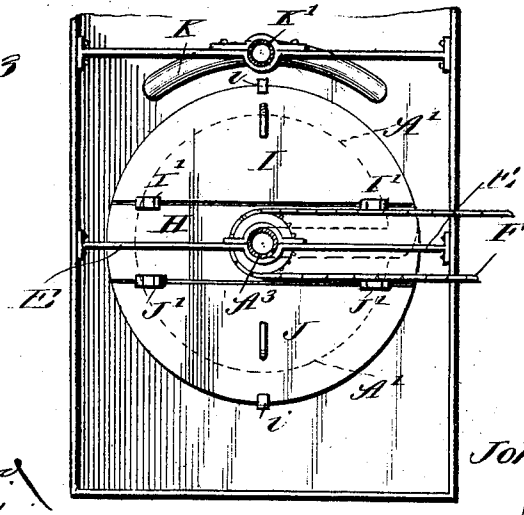


Fig. 3



WITNESSES:

Fred. D. Bradford

Percy B. Purpin

INVENTOR

John C. Raymond.

BY Munn & Co.

ATTORNEYS

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 773,420. Patented October 25, 1904.

UNITED STATES PATENT OFFICE.

JOHN C. RAYMOND, OF NEW YORK, N. Y.

COMBINED STEAM-GENERATOR AND GRATE.

SPECIFICATION forming part of Letters Patent No. 773,420, dated October 25, 1904.

Application filed December 17, 1903. Serial No. 185,502. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. RAYMOND, a citizen of the United States, and a resident of New York city, in the borough of Manhattan and State of New York, have made certain new and useful Improvements in a Combined Steam-Generator and Grate, of which the following is a specification.

My invention is an improvement in steam-generators, and has for an object, among others, to provide a novel construction of combined grate and generator; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation, partly in section, of an apparatus embodying my invention. Fig. 2 is a top plan view thereof, and Fig. 3 is a front elevation of the apparatus.

By my invention I seek to provide a grate in the form of a tube wound helically, producing a cylindrical grate with the openings between the coils of sufficient size to permit the escape of ashes and at the same time sufficiently small to retain the fuel when it is being burned.

It will be understood that my grate is designed for use with solid fuel—such as coal, coke, wood, or the like—and I make provision for introducing the fuel and for removing cinders and the like from time to time, as may be necessary.

In the construction shown the grate A is composed of a series of coils A′ of hollow tubing, preferably of copper or the like, adapted for the circulation through the coil of water in order to secure the generation of steam in the coil. At its ends the coil A has its pipes brought to the center and extended at A^2 and A^3 in line with the axis of the coil, it being proposed to introduce water through the extended end A^3 of the coil and to conduct steam or hot water from the opposite end A^2, couplings being provided at B and C for the connection of the steam-delivery pipe B′ and the water-supply pipe C′ in the use of the invention.

The end portions A^2 and A^3 of the coil are journaled in suitable bearings D and E, and the end A^3, or the other end, is provided with a sprocket-wheel F, connected by a chain F′ with any suitable drive-power, so the coil-grate may be revolved in the use of the invention by any suitable power. It will be understood, however, that where desired the grate may be turned by hand without departing from any of the broad principles of my invention. At its rear end the coil-grate is closed by a plate G, suitably secured at such end, as best shown in Fig. 1, while the free end of the grate is provided with a cross-bar extending transversely across it at its middle and affording hinge connections at I′ and J′ for the doors I and J, which may be secured at their free edges when closed by any suitable form of latch *i* or *j*, as will be understood from Figs. 1, 2, and 3 of the drawings. By providing these opposite doors I and J access may be conveniently had to the interior of the coil-grate, at the upper side thereof, for the purpose of introducing fuel or for any other purposes desired. I prefer to make the door in sections I and J, as shown, as thereby access may be had to the upper portion of the fire in the grate without disturbing the lower portion, as will be understood from Fig. 3.

By the described construction it will be noticed I provide a grate composed of helical coils adapted to contain the fuel and support it so it can be revolved from time to time in order to secure any desired shaking action and which is provided at its open end with doors, so the fuel can be introduced and the fire may be manipulated in any desired manner. By revolving the grate I am also able to submit all portions of the coils to the direct action of the heat and so secure the best results from the fire.

In the construction before described I prefer to employ in connection with the coil-grate a supplemental generator in the form of coils K, extending transversely above the coil-grate, with the coils curved from side to side to conform to the curvature of the coil-grate, said supplemental generator having an inlet-pipe K′ at one end for the water and a discharge-pipe K^2 at the other end for the generated steam or hot water, which may be

conducted to any suitable point. By means of this supplemental generator I utilize any waste heat of the coil-grate, and it will be understood that this coil-grate may also be utilized for heating purposes or for cooking or otherwise, as may be desired.

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

1. In an apparatus substantially as described the combination of the grate composed of a pipe coiled helically and provided at its ends with portions in the axial line of the coils, bearings for said portions whereby the grate is journaled so it can be revolved, couplings connecting said portions of the pipe with delivery and discharge pipes, means for closing one end of the coil-grate, a bar extending across the other end of the grate at the center thereof and doors hinged at their inner edges to the opposite edges of the cross-bar, substantially as set forth.

2. A grate composed of coils forming a cylindrical grate adapted to receive solid fuel and having end portions suitably journaled and a door for closing the open end of said grate and adapted to be opened to permit the introduction of fuel substantially as set forth.

3. A cylindrical grate composed of coils of pipe journaled at its ends, a bar crossing one end of the grate and doors hinged to the opposite edges of the bar substantially as set forth.

4. A cylindrical grate composed of coils of pipe, means for closing one end of the grate and doors for closing the other end of the grate and arranged in sections on opposite sides of the axial center of the grate as set forth.

5. A cylindrical grate composed of a hollow pipe disposed in helical coils and having at its ends axially-disposed portions, communicating with their respective ends of the grate, bearings for said portions, means for closing the ends of the grate including a door at one end arranged to be opened whereby to permit the introduction of fuel substantially as set forth.

JOHN C. RAYMOND.

Witnesses:
SOLON C. KEMON,
PERRY B. TURPIN.