

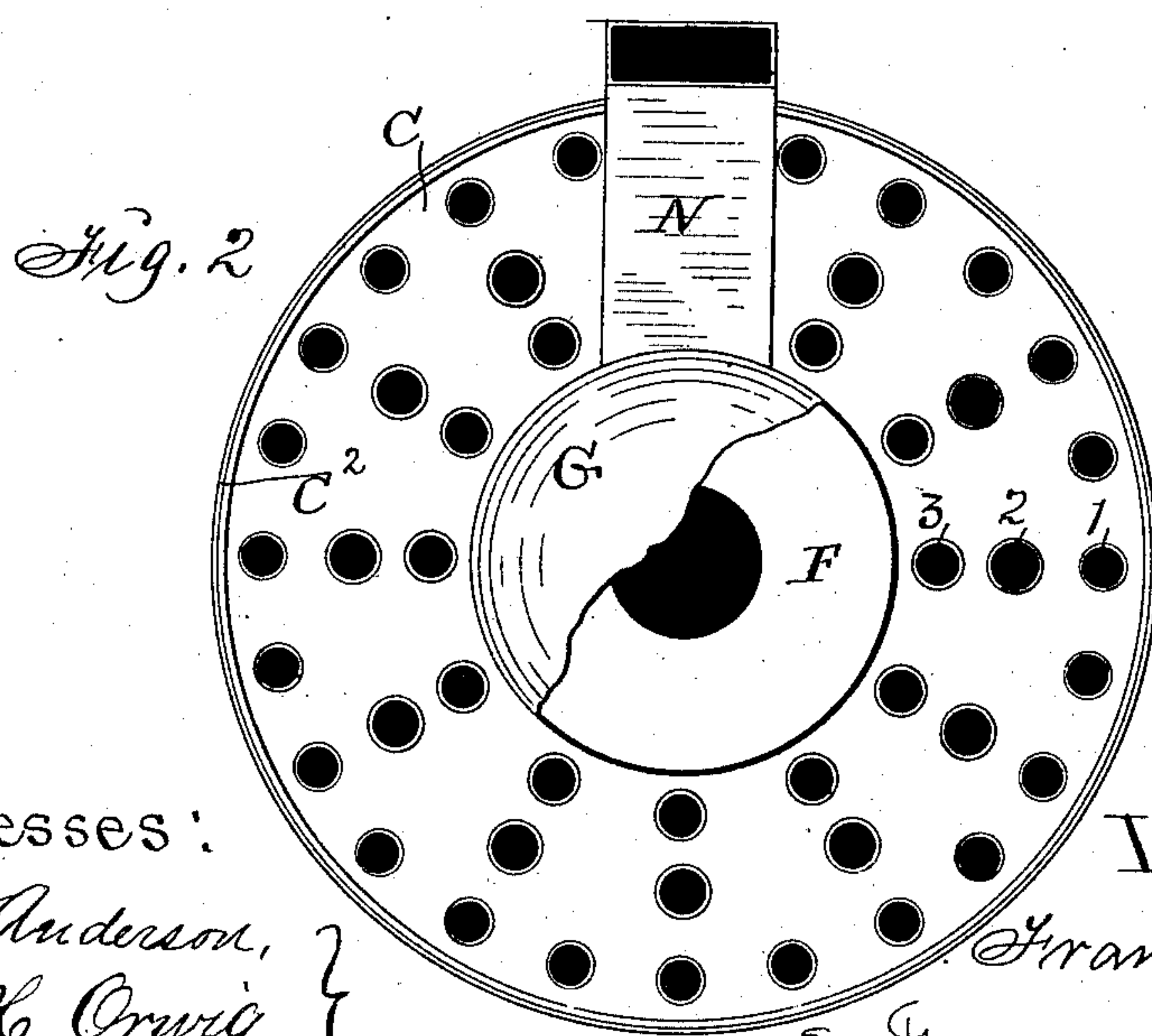
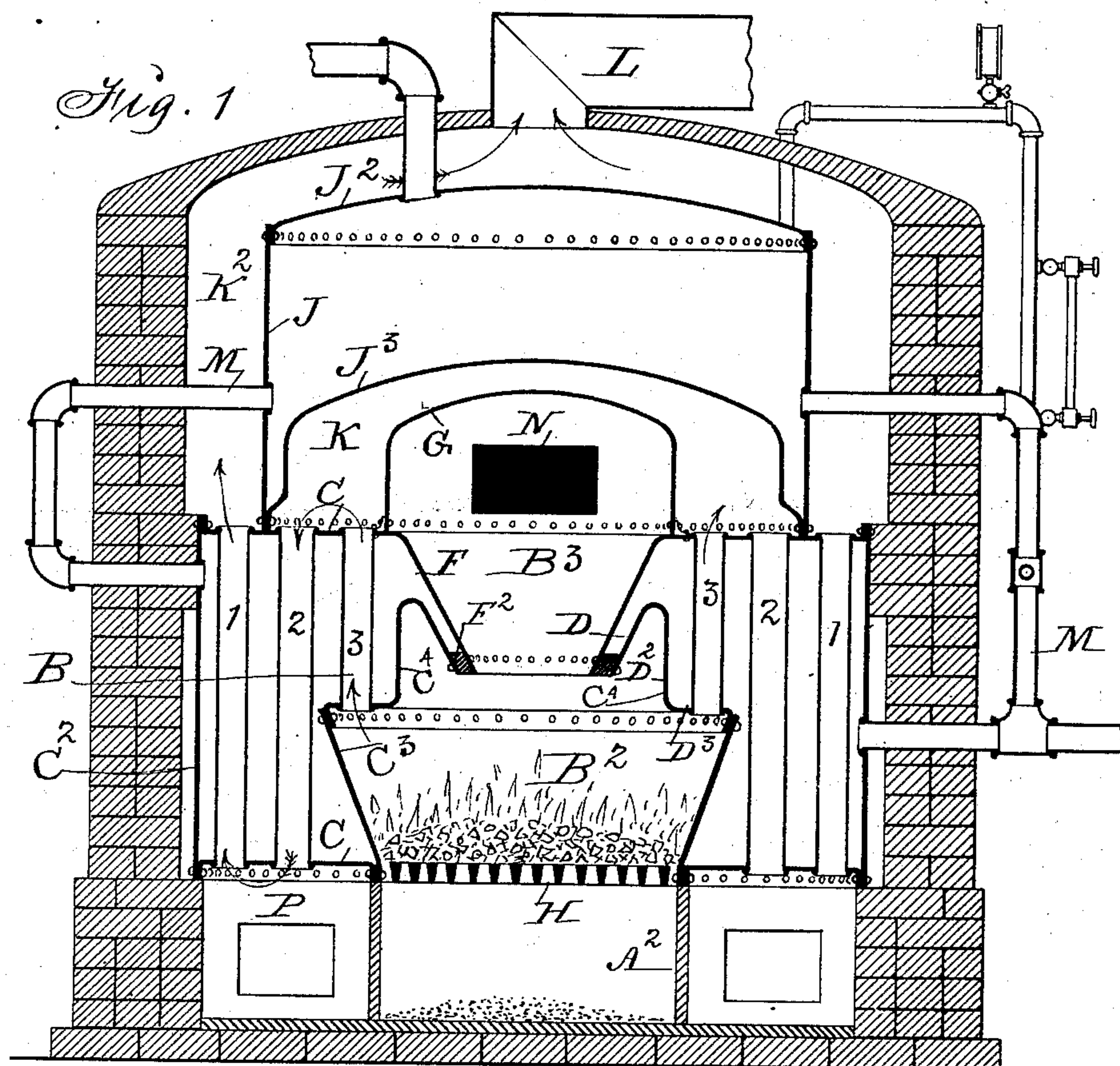
(No Model.)

F. E. WILSON.

BOILER FURNACE.

No. 317,261.

Patented May 5, 1885.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK E. WILSON, OF DES MOINES, IOWA.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 317,261, dated May 5, 1885.

Application filed January 21, 1885. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. WILSON, a citizen of the United States of America, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Improvement in Boiler-Furnaces, of which the following is a specification.

My invention relates to that class of boiler-furnaces in which a fuel-magazine and furnace-chamber are located in the center of a vertical boiler, and the products of combustion passed up through tubes fixed in the lower portion of the boiler into an annular chamber, thence down through a second series of tubes fixed in the boiler, and then again upward between the outside of the boiler and a surrounding wall to a flue.

Heretofore the fuel-magazine extended through the center of the upper section of the boiler, and the draft and smoke flue from the side of the same section, so that the draft was greater on one side of the furnace than the other. My object is to equalize the draft and the circulation of the products of combustion in all the tubes that surround the furnace-chamber in the lower section of the boiler, and to cause the same to envelope the entire outside surface of the upper section of the boiler and concentrate the center of its top to utilize all the heat and all the water-heating surface that can be made to economize fuel in producing steam.

My invention consists in the construction and combination of a boiler-section having a complete fuel-magazine and a complete combustion-chamber formed integral therewith, a boiler-section having a chamber in its bottom to admit the top of the fuel-magazine, an ash-pit, a grate, a furnace-wall, and a flue, as hereinafter fully set forth.

Figure 1 of the accompanying drawings is a vertical section of my complete boiler-furnace. Fig. 2 is a top view of the lower boiler-section, showing part of the closed top of the fuel-magazine broken away. Together they clearly illustrate the construction and operation of my complete invention.

A represents a circular plate resting upon a solid foundation.

A² is the cylindrical wall of an ash-pit, rest-

ing in a concentric position upon the top of the base or plate A.

B represents the lower section of my boiler, having a complete combustion-chamber, B², and a complete fuel-magazine, B³, formed integral therewith.

C C are the top and bottom pieces of the boiler-section B.

C² is the cylindrical outside wall, riveted to the circumferences of the ring-shaped plates C, as required, to produce a section that is uniform in its diameter from top to bottom.

C³ is the lower portion of the inner wall, riveted at its lower end to the edge of the circular opening of the lower piece C. Its diameter is larger at its top than its bottom.

C⁴ is a plate riveted to the top of the wall or plate C³, and extends horizontally inward, then vertically, thence downward and inward. It may be formed complete in one piece, or in sections D, D², and D³, riveted together, and to the flaring plate or wall C³, to produce the complete combustion-chamber B².

F is a plate or wall corresponding in shape with the part C³, but smaller in diameter, fixed to the edge of the circular opening in the top plate or head C.

F² is a metal ring placed between the edges of the concentric parts and edges of the pieces D³ and F, and secured by transverse bolts or rivets to produce a steam-tight joint and a rigid solid base on the lower end of the lower portion of the fuel-magazine B³ thus produced.

G is the top portion of the fuel-magazine, riveted to the top edge of the lower portion, F.

Numbers 1 and 2 are series of open-ended tubes in concentric position, that extend vertically through the boiler-section B. Numbers 3 are shorter tubes that extend from the part D to the top head C.

The combined boiler-section, combustion-chamber, and magazine thus constructed is placed upon the top of the ash-pit wall A², and a shoulder formed in the brick wall that incloses it, as clearly shown in Fig. 1.

H represents a grate supported at the top of the ash-pit wall.

J is the cylindrical plate and wall of the upper boiler-section, J² the top plate, and J³ the bottom plate, riveted together to produce a

complete boiler-section adapted to be placed on top of the lower boiler-section in such a manner that it will inclose and conceal the fuel-magazine B³ and produce a chamber, K, over and around the top of the magazine and the series of tubes 2 and 3, as clearly shown in Fig. 1. The diameter of the upper boiler-section thus constructed and placed is less than the diameter of the lower section, and the brick-work built up around the two sections and the arched roof on top of the wall do not come in contact with the upper section, and consequently a chamber, K², is produced that surrounds the entire upper boiler-section.

L represents a smoke-flue at the top and center of the chamber K².

M are tubes connecting the upper and lower boiler-sections in a common way as required to circulate water and steam in the complete boiler.

N represents a chute extending from the fuel-magazine outward as required to facilitate the introduction of fuel.

P is an annular chamber surrounding the ash-pit. Dotted lines indicate the position of doors in the chamber P, the ash-pit, and the combustion-chamber.

In the practical operation of a complete boiler-furnace thus constructed the products of combustion ascend from the combustion-chamber through the inner and short series of tubes number 3, into the chamber K; thence down through the series number 2 into the chamber P; thence up through the series number 1 into the chamber K², where they converge toward the smoke-flue L. Each tube in each series is an equal distance from the smoke-flue, and consequently the draft is equal in all the tubes of each of the three concentric series of tubes that extend through the lower boiler-section, and the heat generated is thereby uniformly distributed over a large area of water-

heating surface and absorbed to produce steam, so that very little is allowed to reach the escape-flue to be carried off with the smoke.

I claim as my invention—

1. The boiler-section composed of the heads C, the cylinder or wall C², the walls C³, C⁴, and F, the magazine-cover G, and the series of tubes numbers 1, 2, and 3, substantially as and for the purposes stated.

2. A boiler-section having a chamber in its under side, in combination with a boiler-section having a combustion-chamber in its lower portion and center, open-ended tubes extending vertically through it, and a fuel-magazine extending down into the combustion-chamber and upward above the top surface of the boiler-section, to operate in the manner set forth, for the purposes stated.

3. The boiler-section composed of the heads C, the walls C², C³, C⁴, and F, the series of open-ended tubes 1, 2, and 3, the cover G, and a boiler-section of smaller diameter, having a chamber in its under side adapted to inclose the cover G and to admit products of combustion through the series of tubes number 3, and escape through the series of tubes number 2, arranged and combined as and for the purposes stated.

4. A boiler-section composed of heads C, walls C², C³, C⁴, and F, series of open-ended tubes 1 2 3, a cover, G, a boiler-section of smaller diameter, having a chamber in its under side, a grate, an ash-pit wall under the grate, and an inclosing-wall having an arched roof and a smoke-flue in the center of the roof, arranged and combined to operate in the manner set forth, for the purposes stated.

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Witnesses:

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