

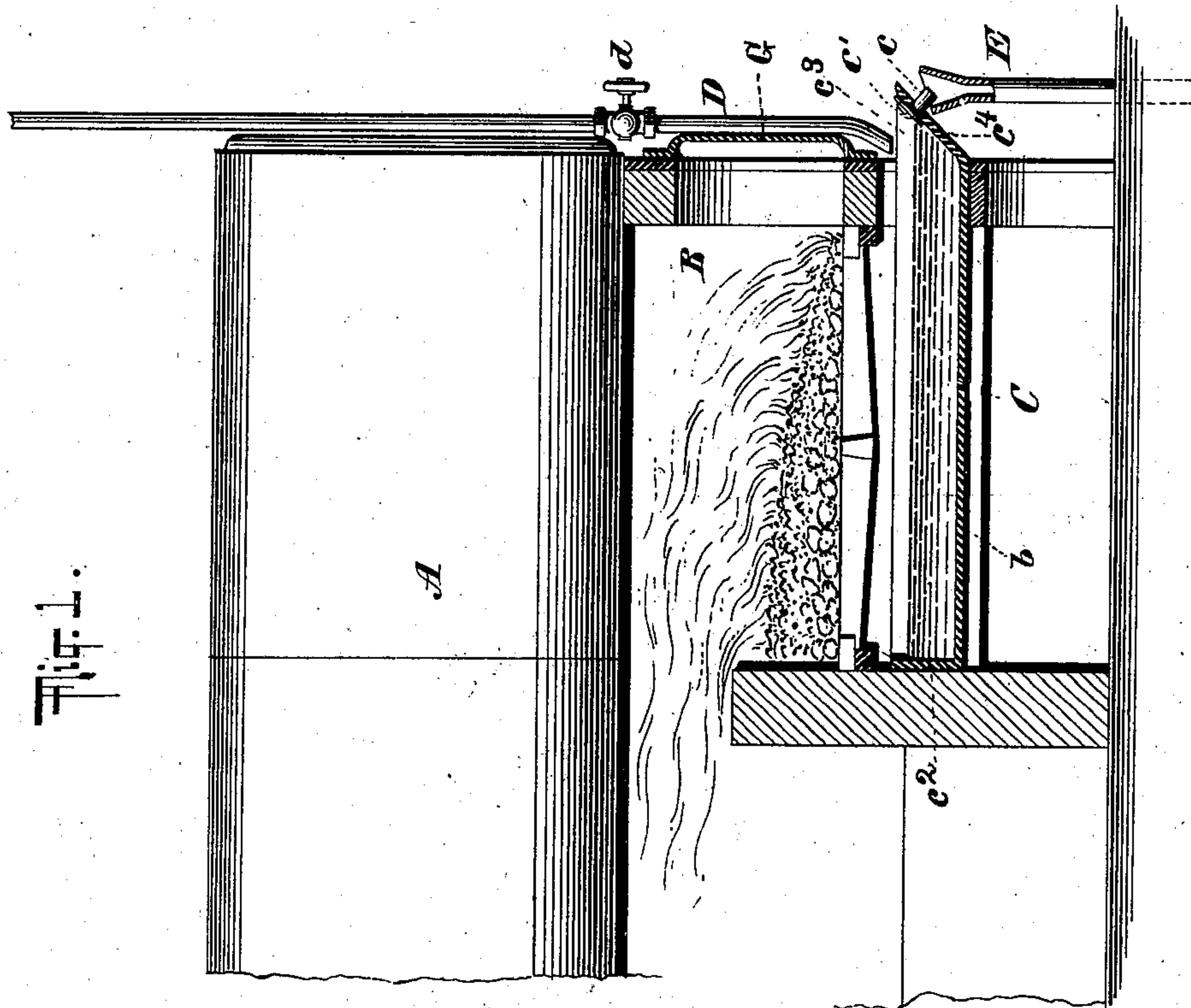
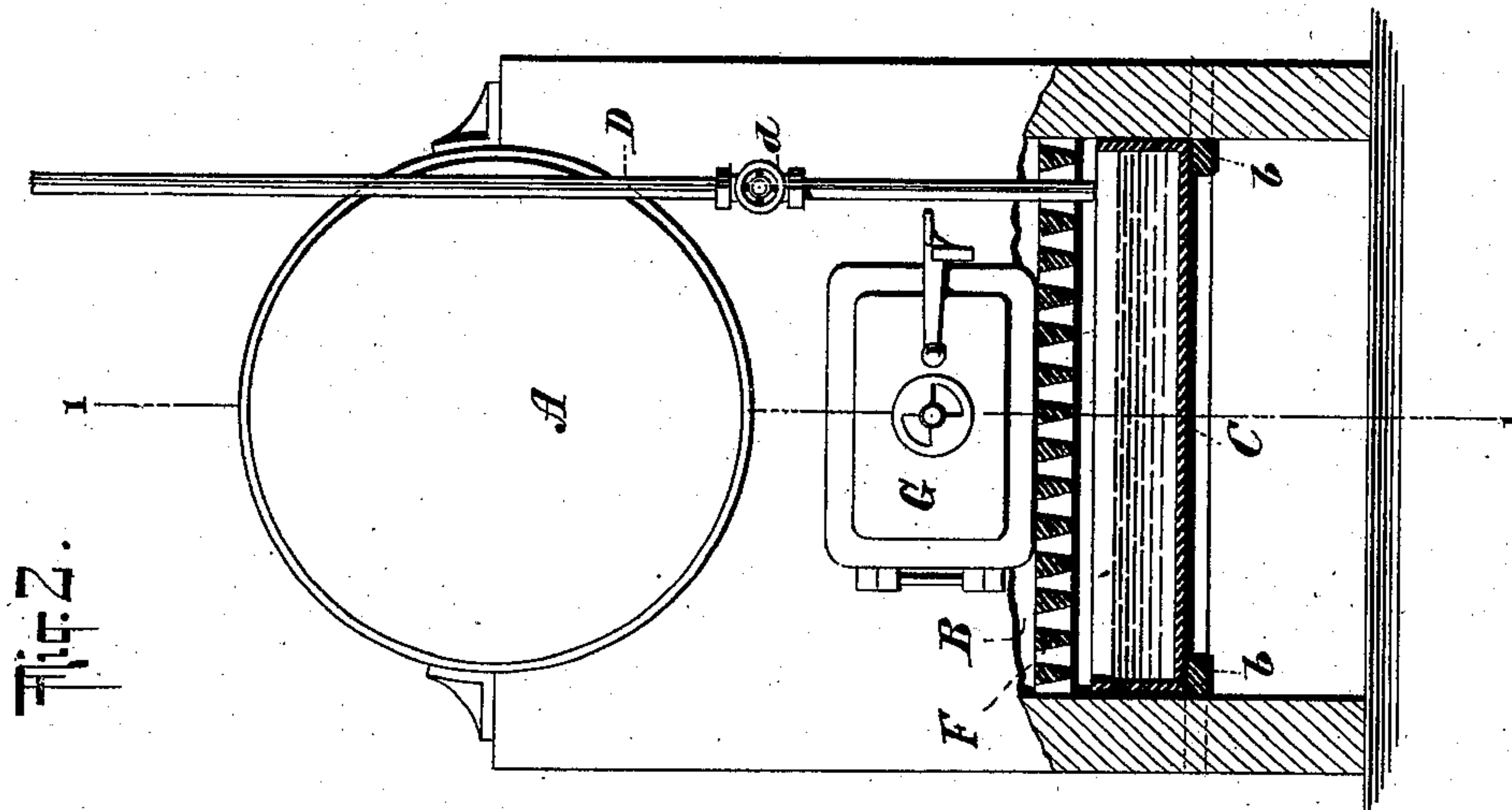
**No. 702,694.**

**Patented June 17, 1902.**

H BERGFLETH.  
BOILER.

(Application filed Mar. 10, 1902.)

(No Model.)



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

HENRY BERGFLETH, OF NEW YORK, N. Y.

## BOILER.

SPECIFICATION forming part of Letters Patent No. 702,694, dated June 17, 1902.

Application filed March 10, 1902. Serial No. 97,401. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY BERGFLETH, a citizen of the United States of America, and a resident of New York city, in the county and State of New York, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

My invention has reference to improvements in boilers; and it relates particularly to a boiler-furnace attachment whereby I attain a more perfect combustion of the fuel and a higher heat, producing thus more steam in a shorter time with a given quantity of fuel.

It is well known that obnoxious clinkers are forming in all fire-pots during the combustion of the coal. These clinkers are a deterrent to the fire, they entail a loss, and have to be removed by the operator.

It is the special object of my invention to utilize the clinkers during the continuance of the fire to the greatest advantage. The clinkers are used up until they practically form ashes.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 represents in longitudinal section on plane of line 1 1 of Fig. 2 the boiler and furnace embodying my invention; and Fig. 2 illustrates same in front view, partly broken away.

Similar letters of reference denote like parts in all the figures.

In the drawings, A represents the boiler.

B is the flue for the flame-gases, and F represents the grate-bars. Below the grate there is provided an iron pan C, which is located right beneath same. The pan C is rectangular on its rear inside portion  $c^2$ , while the front portion forms a mouth  $c^3$  under an obtuse angle, so that the portion  $c^4$  extends beyond the boiler-wall and furnace-door G, leaving thus a free space outside. This pan is filled with water, which is supplied by the water-pipe D. A water-supply-regulating valve  $d'$  is provided in the pipe D at convenient location. In order to prevent an overflow of water from the pan C, a flow-off pipe  $c$  is provided near the top of the obtusely-angular front portion  $c^4$  of the pan. The small flow-off pipe  $c$  issues into a waste-pipe E, which conducts the water away. The pan C also serves as the ash-pan. By means of the open

space above the obtusely-angular front portion the ashes are removed from time to time by raking them out through the water. The mouth  $c^3$  is sufficiently large to permit of doing so.

Assuming now that a fire has been made and the coal is glowing, then the pan C is filled with water. In the course of a short time clinkers will be formed, as usual, and these are objectionable. By the heat of the fire and the heated grate-bars the water is gradually heated and by and by water-vapor evolved. The draft created will carry the water-vapor up through the clinkers and coal, where the water-vapors are decomposed by the incandescent clinkers and coal, forming oxygen and nitrogen, of which the first entertains combustion, while the latter is a combustible gas in itself. Of course the air drawn into the furnace passes the surface of the water and takes water-vapors along. It is charged with some water-vapor, and thus increases the effect when passing the clinkers and coal. In this manner the combustion of the coal is greatly augmented and the clinkers are gradually used up until they practically are used up, leaving nothing but ashes. By this I attain a complete combustion of the coal and clinkers, producing thus a higher heat in a shorter time with a given quantity of fuel, and thereby I generate more steam in a given time with a given quantity of coal.

The pan C rests on supports  $b$ , which may be arranged lower or higher, so that any convenient size of pan may be used.

A small cover  $c'$  is provided in the top portion of the obtusely-angular part  $c^4$ , covering the flow-off pipe  $c$ . This cover  $c'$  is let down on the top opening of the pipe  $c$  when it is desired to remove the ashes from the pan C. The cover  $c'$  may also be let down when the coal and clinkers are really incandescent, so that the pan C may be filled higher up with water, whereby the surface of the latter comes nearer to the grate and glowing fuel, causing thus an increased evaporation and a more vivid combustion of the coal and clinkers, and thereby an increased production of steam.

The grate-bars are substantially far apart, so that most of the ashes fall through by itself, and little raking of the fire is necessary.



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

1. A boiler and furnace with grate-bars substantially far apart in combination with a water-pan located right beneath the grate-bars and having a rectangular rear portion, an obtusely-angular front portion forming a mouth extending beyond the furnace-door and boiler-wall, a flow-off pipe in the top portion of the obtusely-angular front part, a cover adapted to close the flow-off pipe, a waste-pipe, and a water-pipe with water-supply-regulating valve.
2. In an improved boiler and furnace grate-bars substantially far apart, a water-pan located right beneath the grate-bars having a rectangular rear portion, an obtusely-angular front portion forming a mouth which extends beyond the furnace-door and boiler-

wall, a flow-off pipe in the top portion of the obtusely-angular front part, a cover on the top opening of the flow-off pipe adapted to close same, and a waste-pipe.

3. In an improved boiler and furnace a water-pan located beneath the fire having a rectangular rear portion, an obtusely-angular front portion forming a mouth which extends beyond the furnace-door and boiler-wall, a flow-off pipe in the top portion of the obtusely-angular front part and a cover on the top opening of the flow-off pipe adapted to close same.

Signed at New York, N. Y., this 8th day of March, 1902.

HENRY BERGFLETH.

Witnesses:

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