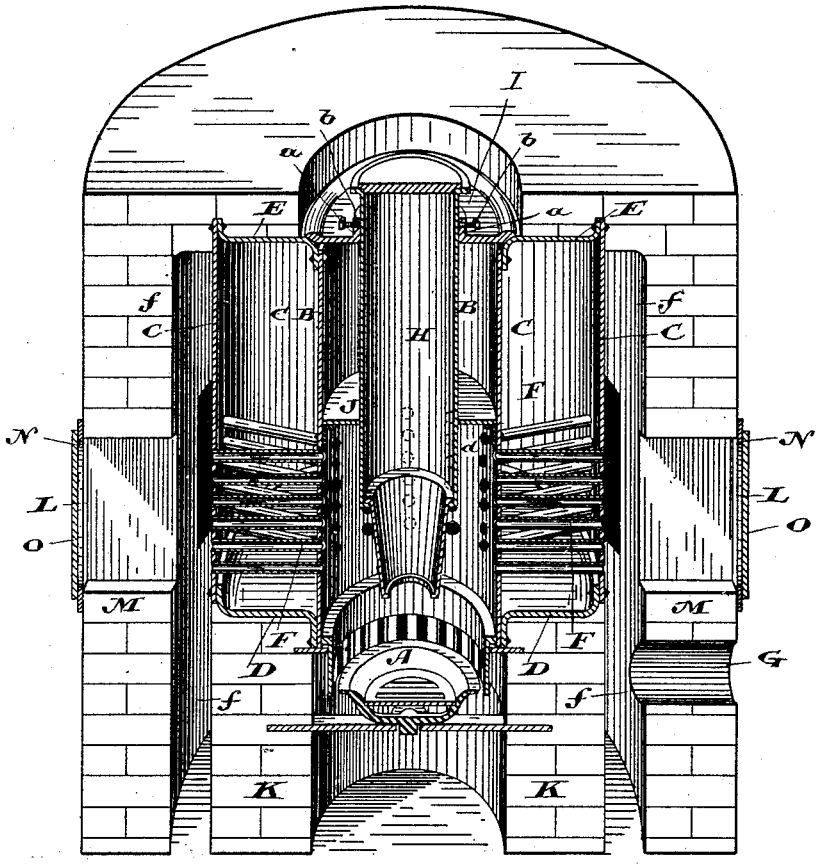
(No Model.)

R. W. KING.

STEAM BOILER.

No. 345,849. Patented July 20, 1886.



Witnesses.
F B Fetherstonhaugh.
James L. Maybee

Inventor.
R. W. King
by Donald C. Ridout & Co
Attys

UNITED STATES PATENT OFFICE.

ROBERT W. KING, OF GEORGETOWN, ONTARIO, CANADA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 345,849, dated July 20, 1886.

Application filed April 2, 1886. Serial No. 197,557. (No model.)

To all whom it may concern:

Be it known that I, ROBERT WILLIAM KING, of the village of Georgetown, in the county of Halton, in the Province of Ontario, Canada, engineer, have invented an Improved Steam-Boiler, of which the following is a specification.

The object of the invention, among other things, is to so construct a steam-boiler that no plate where mud can accumulate shall be in direct contact with the flames from the furnace of the boiler; and it consists, essentially, in constructing a boiler with a central furnace from which tubes radiate to an outer chamber formed around the shell of the boiler, and connecting with the chimney or main flue, the boiler being so constructed that its bottom plate shall rest upon a supporting-wall which surrounds the lower portion of the furnace, while its top plate is completely cut off from the furnace or heated gases arising therefrom, the whole being constructed substantially as and for the purposes hereinafter more particularly explained.

The drawing represents a sectional perspective elevation of my improved boiler.

In the drawing I have cut away the portion of the boiler where the furnace-door, if used, would be placed; but as I do not claim any peculiarity in this portion of the boiler such omission is of no consequence. The same excuse may be offered for not showing a safety-valve, stays, or steam-pipes to utilize the steam generated in the boiler. These and other minor details are matters of purely mechanical construction familiar to any engineer.

A represents the furnace of the boiler, formed within the inner shell, B. The outer shell, C, is connected to the inner shell, B, by the bottom plate, D, and the top plate, E. The annular space formed between these plates constitutes the water and steam space for the boiler. A series of horizontal tubes, F, radiate from the furnace A, through the water-space referred to, to the space *f*, which surrounds the boiler, and is provided with an outlet, G, from which communication is made to the chimney or main flue.

When the furnace is to be made a self-feeder, an ordinary coal-magazine, H, is employed. This coal-magazine passes through a hole in the covering-plate I, which has formed on it an annular flange, *a*, through which one or more set-screws, *b*, are screwed for the purpose of jamming against the magazine H, and thereby hold it in any desired altitude.

J is a dead-plate supported on the angle-iron *d*, secured to the inner surface of the shell B, immediately above the top row of the tubes F. This plate J fits around the coal-magazine H, forming a stay for it as well as a stop or dead plate to direct the flames and heated gases through the tubes F, keeping them away from the top portion of the shell B. By loosening the set-screws *b* the coal-magazine H may be withdrawn, so that wood may be burned in the furnace; or, if a door is provided for the furnace the fuel may be fed through it. In case of the magazine being withdrawn, the plate J is made solid--that is to say, without any hole in it. The bottom plate, D, it will be noticed, rests upon the annular wall K, which surrounds the furnace A, and as it is on this plate that any mud or sediment from the water will accumulate no damage from such accumulation can occur, as the plate D is not in direct contact with the flames. Suitable mud-holes can readily be provided for the purpose of cleaning out the sediment. It will be noticed that the tubes F are immediately over each other. Consequently the top row of tubes will in a measure protect those below them from any settling sediment, and anyway, the tubes being round, very little sediment can rest on them, certainly not enough to do any harm.

With the view of readily cleaning the interior of tubes, I make a series of the openings, L, in the outer wall, M, immediately opposite to each vertical row of tubes F. These openings I close by an annular plate, N, which surrounds the outer wall, M, and has a series of openings in it opposite to each opening L and protected by a movable door, O. From this description it will be seen that the flame and heated gases from the furnace A will pass through the horizontal tubes F into the space *f*, which space forms a valuable auxiliary to the furnace A, by keeping the outer shell, C, hot, securing the full benefit from the fire, and, in connection with the horizontal tubes described, enables me to provide a boiler with a large water and steam space and a proportion-

ately larger heating-surface than can be obtained in an ordinary vertical-tube boiler.

What I claim as my invention is—

1. The inner shell, B, surrounding the furnace A, and connected at its lower end to the outer shell, C, by the plate D, resting on the wall K, in combination with a series of tubes, F, arranged to connect the furnace A with the space *f*, substantially as and for the purpose specified.

2. The inner shell, B, surrounding the furnace A, and connected at its lower end to the outer shell, C, by the plate D, resting on the wall K, in combination with the dead-plate J and tubes F, substantially as and for the purpose specified.

3. The inner shell, B, surrounding the furnace A, and provided with a covering-plate, I, having an annular flange, *a*, formed on it to receive the set screw or screws *b*, in combination with the coal-magazine H, arranged substantially as and for the purpose specified.

4. The tubes F, connecting the furnace A with the space *f*, in combination with the openings L, formed in the wall M and protected by detachable doors O, substantially as and for the purpose specified.

Toronto, March 17, 1886.

ROBT. W. KING.

In presence of—

CHARLES C. BALDWIN,

J. M. JACKSON.