

J. Wells.
Fire Tube.

N^o 93,377. Patented Aug. 3, 1869.

Fig. 1.

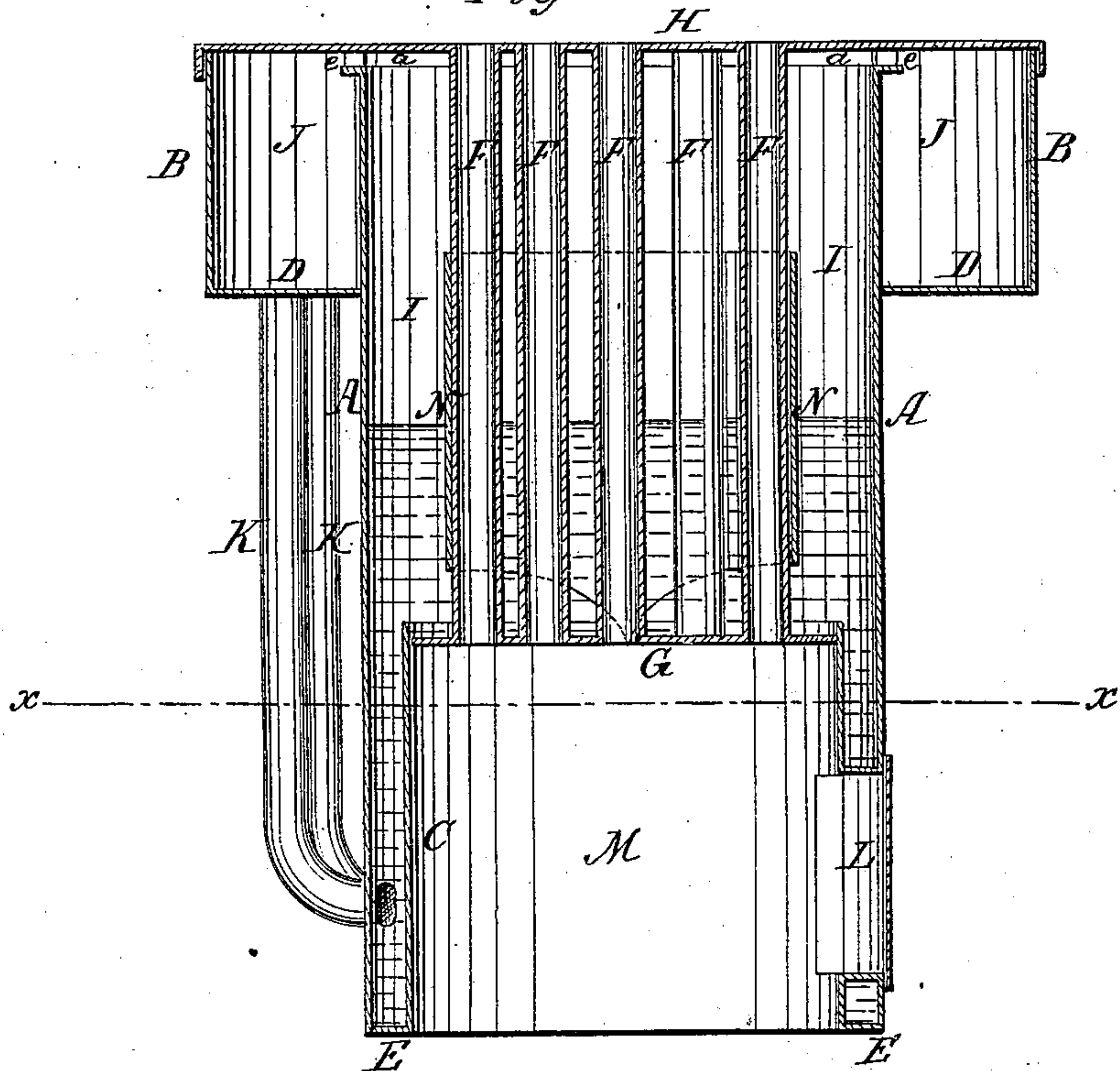
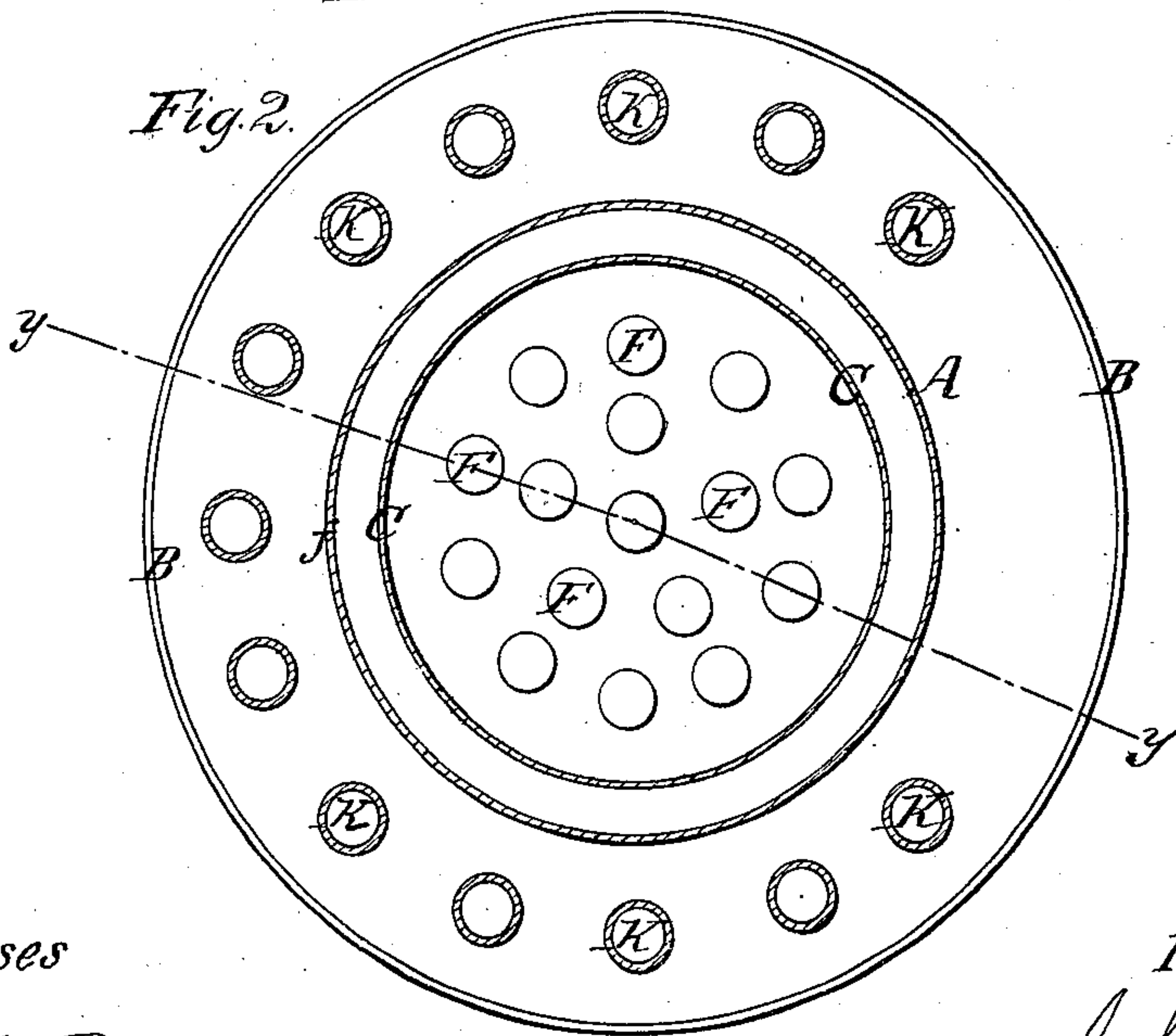


Fig. 2.



Witnesses

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JOHN WELLS, OF BALTIMORE, MARYLAND.

Letters Patent No. 93,377, dated August 3, 1869.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN WELLS, of the city and county of Baltimore, and State of Maryland, have invented a new and improved Circulating Steam-Boiler; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section, through line *y y* of fig. 2.

Figure 2 is a horizontal section, through line *x x* of fig. 1.

The object of this invention is to construct the boiler in such a manner that it will effectually separate the dry steam from the wet, condensing the latter, and returning the water of condensation to the water-space, while at the same time the water is caused to circulate more freely than heretofore among the heating-pipes, whereby the heat is thoroughly utilized.

In the drawings—

A is a vertical hollow cylinder, the upper end of which is enclosed in a larger cylinder, B, and the lower end of which encloses a smaller cylinder, C, the cylinders A and B being connected by an annular rim, D, and the cylinders A and C being connected by a similar rim, E, forming the bottom of the boiler, as shown in fig. 1.

F F F are a series of vertical smoke-pipes, open at both ends, their lower ends being set in a circular plate, G, which fits closely in and is securely attached to the upper end of the cylinder C, and their upper ends set in a large circular plate, H, which is fastened to and forms the top of the larger cylinder B.

a a are a space between the upper end of cylinder A and the under side of the cover H, through which steam passes from the space I, within the central cylinder, to the dry-steam space J, outside of it, and within cylinder B.

K K are pipes, arranged at suitable points, to convey the water of condensation off to the lower part of the boiler, in order that it may be again utilized.

L is the furnace-door, and

M is the fire-chamber.

The upper end of cylinder A may be furnished with

projecting blocks *e e e*, which support the central part of the cover H, as shown in fig. 1.

The middle and lower parts of the pipes F F are enclosed in a loose jacket, N, under which, at *o o*, is an opening, or openings, through which the water may flow inward toward the heating-pipes F, in order to take the place of the water that, having been heated, is forced upward around said pipes.

The operation of this apparatus is easily understood. By the heat radiated from the pipes F F, the water near them is forced upward, and is compelled to descend in the space outside of the jacket, and pass under the latter, thus maintaining a constant and rapid circulation, and bringing every part of the water often in contact with the heated walls G G or the pipes F F. Meanwhile, of the steam in space I, the dry or uncondensed steam passes over into space J, whence it is taken for use, while the particles of water fall back to the water-space, without passing over to any appreciable extent. Should any, however, pass over into the dry-steam space, it collects and runs down through pipes K K, into the water-space.

All the dry-steam that condenses in space J, by contact with the walls B D H, follows the same course, leaving the steam in that chamber as nearly "dry" as it is practicable to obtain.

The water may, in this form of boiler, be used at almost any height, even so as to pass over and partially fill the space J, without destroying the working-efficiency of the boiler.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

The combination of the return-pipe, or pipes K, with the cylinders A B C, pipes F F, and jacket N, when said parts are constructed and arranged substantially as described and shown, and the return-pipes are made to connect the bottom of cylinder B with the lower end of cylinder A, substantially as herein set forth.

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Witnesses:

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