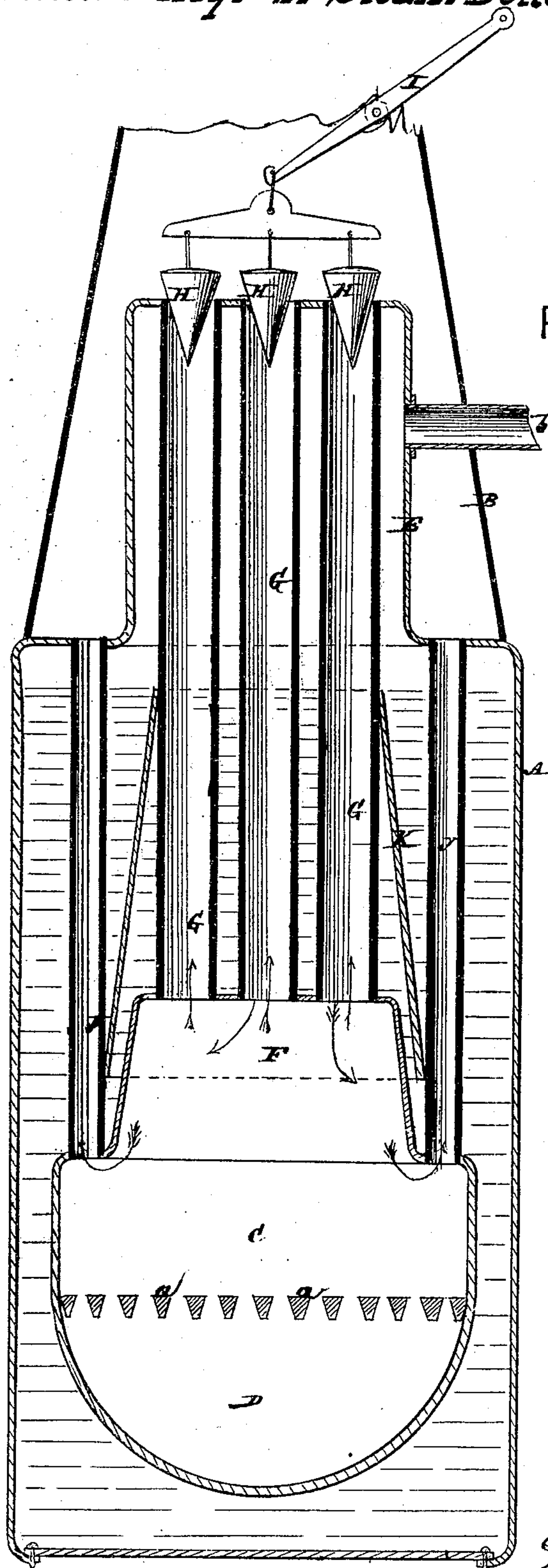


J.A. Miller's Improv^d in Steam Boilers. (A)

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PATENTED
JAN 14 1868



Witnesses.
M. C. M. C.
A. Keller

J. A. Miller
per Brown, Gould & Co.
Atty

United States Patent Office.

JOSEPH A. MILLER, OF PROVIDENCE, RHODE ISLAND.

Letters Patent No. 73,363, dated January 14, 1868.

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, JOSEPH A. MILLER, of Providence, in the county of Providence, and State of Rhode Island, have invented a new and useful Improvement in Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and which represents a sectional elevation of a steam-boiler constructed in accordance with my improvement.

My invention consists in a combination of a fire-box or chamber provided with a dome or upper chamber, vertical fire-tubes or flues passing from the latter through the water and steam-space of the boiler into the smoke-box or escape, and controlled, at or near their upper ends, by valves or stoppers, to regulate or shut off the draught through them, together with side fire-flues, connecting the fire-box below the dome with the smoke-box, whereby a variable character is or may be given to the boiler, so as to effect a quick or slow combustion at pleasure; a reverberatory action insured to the furnace to the effectual combustion of the gases, and an improvement in the generative power of the boiler, and economy generally produced; and the invention further consists in a combination, with the smoke-tubes or flues, of valves or stoppers, of a conical form, for controlling the outlets to said flues.

Referring to the accompanying drawing, A represents the outer shell or case of the boiler, which, together with the smoke-box or chamber B above, may be of round, oblong, or other form. C is the fire-box, to which *a* are the bars and D the ash-pit. Connected so as to form a closed junction with the outer case, and arranged at a moderate height above the water-level of the boiler, within the smoke-box B, is a steam-dome or chamber, E, from which *b* is the steam-supply pipe. Extending upward from a fire-dome, F, to the fire-box or chamber C, through the water-space and steam-dome E, and connecting the fire-dome with the smoke-box, above the steam-dome, are any number or series of vertical fire-tubes or flues G, provided at or near their upper ends with valves or stoppers H, preferably of a shape resembling inverted cones, and raised or lowered in unison, by means of a lever, I, or its equivalent, so as to fully open, or partly or fully close, as required, the exit or upper ends of the tubes G. In addition to these last-mentioned tubes, are other fire-tubes J, of any suitable number, and occupying a side relationship, as it were, the same connecting the fire-chamber C, at bottom of or below the fire-dome, with the smoke-box B. At (say) its base, K, is a deflector, or it may be deflecting-plates, for inducing an active up-and-down circulation of water in the boiler, and at or about the upper edge or edges of which is the usual water-level—the water here being shown to surround the several fire-tubes, for a portion of their height at least—fire-dome, chamber, and ash-pit of the boiler.

From this description, it will be seen that the advantages aimed at in this, my improvement, are effectually secured. Thus, when a quick combustion and direct through-draught is required, as on starting the fire, or in getting up steam, or whenever a larger or quicker generation of steam is required, the valves or stoppers H H should be more or less raised so as to open the exit-ends of the fire-tubes G; but after the fire has fairly burnt up, or steam raised, and a slower combustion will suffice, then the valves or stoppers H H should be lowered to close, or nearly so, the tubes G. This choking or closing of the tubes G produces a reverberatory action within the fire-dome F, causing an up-and-down circulation of the heated gases within the tubes G, with the exposure of their highly-heated surfaces to both the water and the steam to effect generation and drying of the steam, and further, causing an intense heat within the fire-dome F, and combustion of the gaseous products of combustion by the reverberatory action which takes place therein on the draught being established through the side tubes or flues J, instead of, or more fully than as before, through the tubes G. In this way, or by these means, and by simply raising or lowering, at pleasure, the valves or stoppers H H controlling the exit-ends of the tubes G, is a variable character given to the boiler to a greater extent, and quicker in range or action than is or could be attained by any ordinary damper-arrangement. The conical form of the valves H H is preferred, as giving a largely-variable control to or over the smoke-tubes G.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of the fire-dome F with the fire-chamber C and tubes G J, arranged and operating essentially as herein set forth.

2. The arrangement of the valves H within the smoke-box for controlling the central or fire-dome flues, substantially as shown and described.

JOSEPH A. MILLER.

Witnesses:

CHARLES SELDEN,
HENRY AUSTIN.