

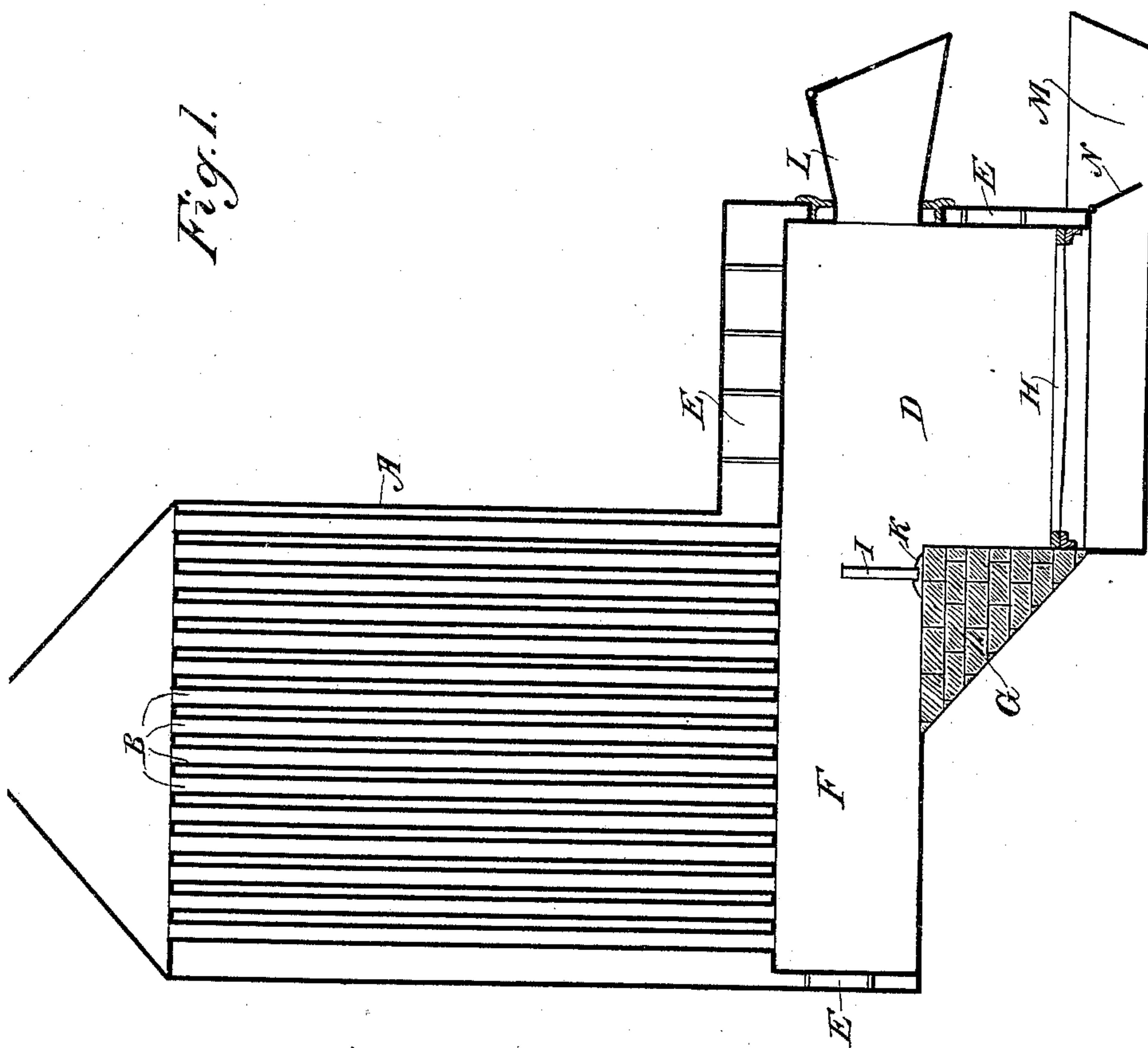
(No Model.)

2 Sheets—Sheet 1.

D. BEST.
BOILER.

No. 436,933.

Patented Sept. 23, 1890.



Witnesses,
Geo. H. Strong
J. H. H. H.

Inventor
Daniel Best
By Dewey & Co.
attys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

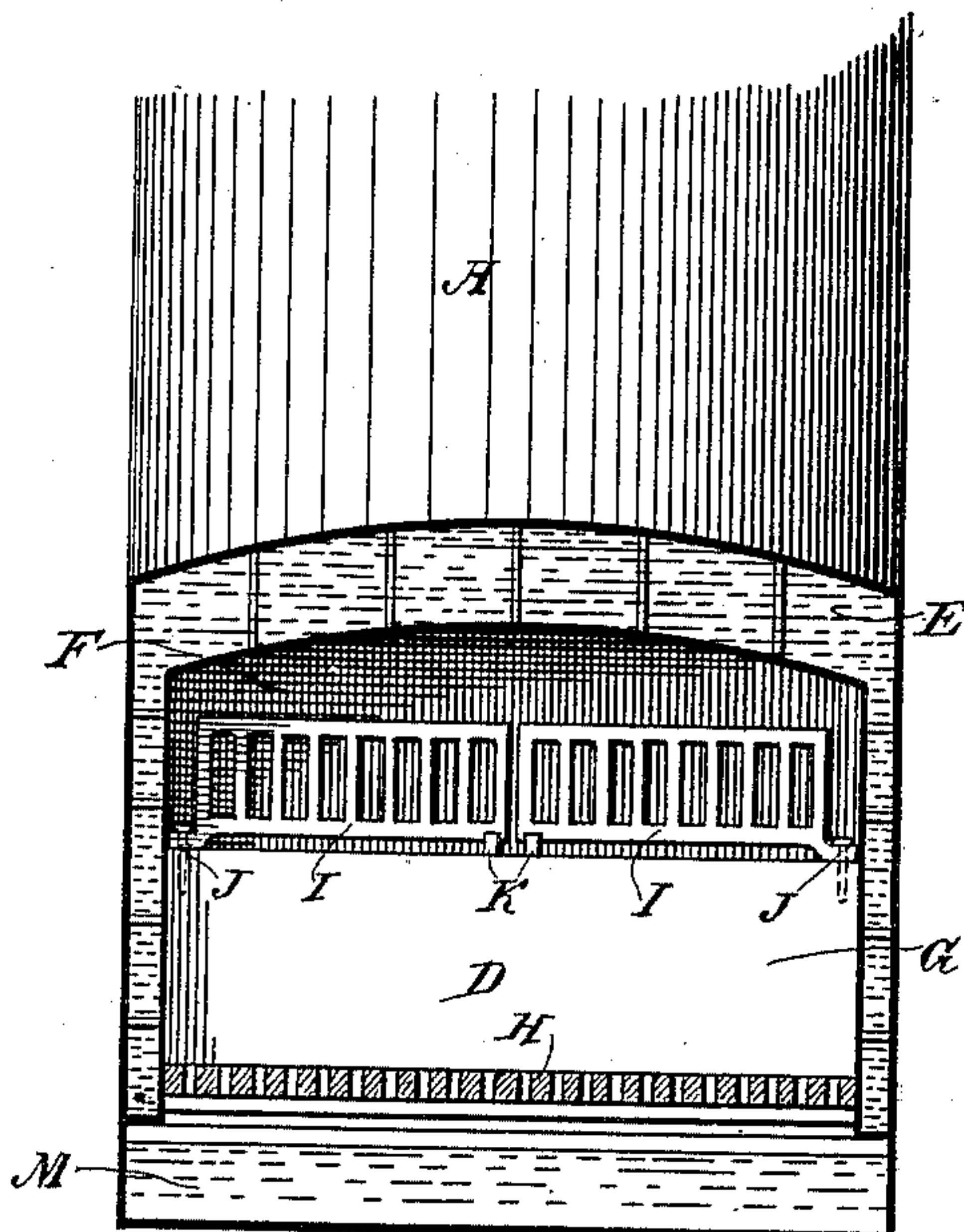
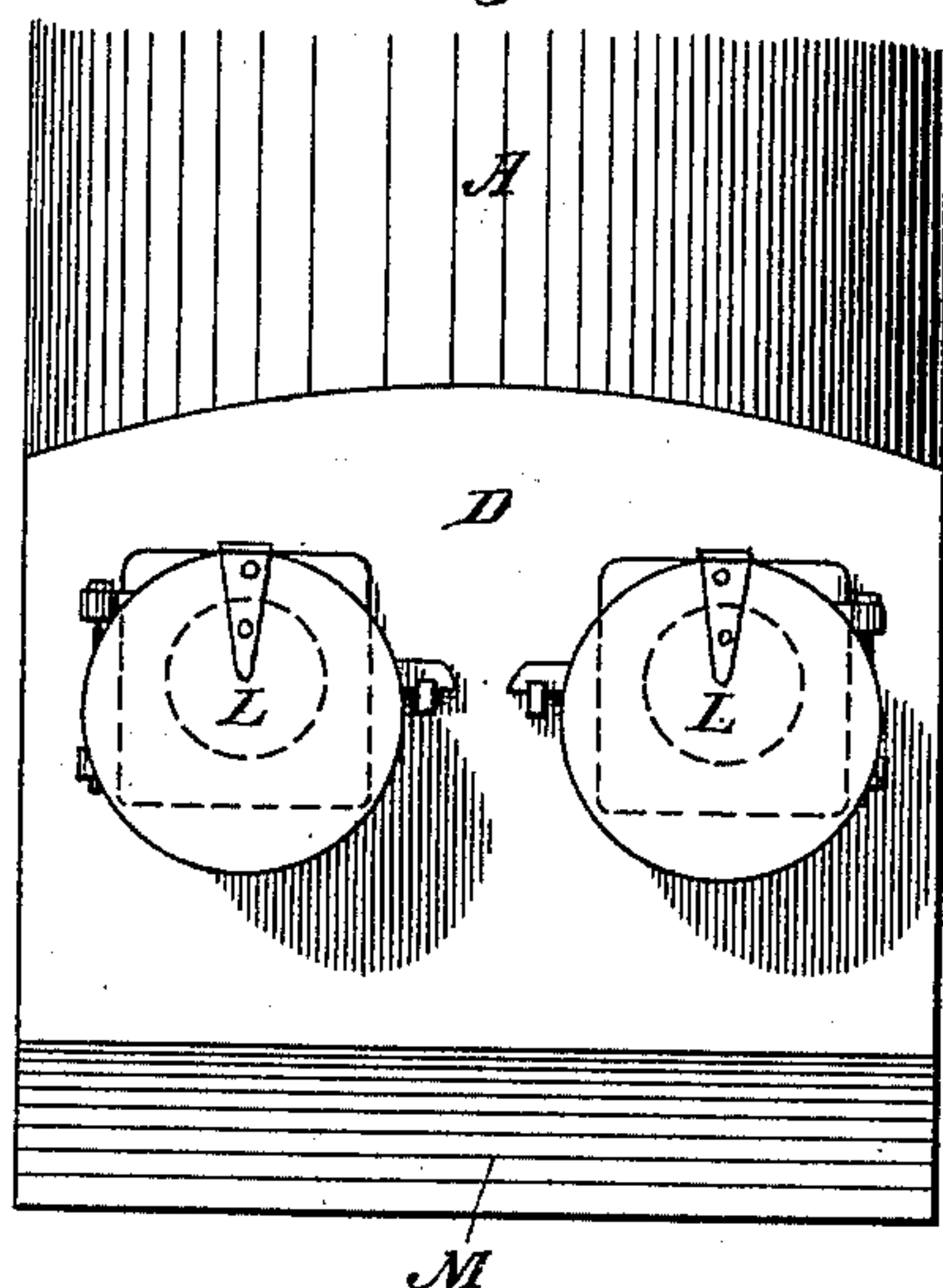


Fig. 3.



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UNITED STATES PATENT OFFICE.

DANIEL BEST, OF SAN LEANDRO, CALIFORNIA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 436,933, dated September 23, 1890.

Application filed April 29, 1890. Serial No. 349,949. (No model.)

To all whom it may concern:

Be it known that I, DANIEL BEST, a citizen of the United States, residing at San Leandro, Alameda county, State of California, have
5 invented an Improvement in Boilers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in steam-boilers, and it is especially
10 adapted for that class of boilers, which are known as "portable boilers," being mounted upon wheels and employed in connection with traction and field engines.

It consists in certain details of construction, which will be more fully explained by
15 reference to the accompanying drawings, in which—

Figure 1 is a vertical section taken through the boiler and furnace. Fig. 2 is a vertical
20 section taken transversely through the furnace portion. Fig. 3 is an exterior view showing the arrangement of the feed-doors.

A is the vertical cylindrical shell of my boiler having heads at top and bottom, and
25 flues B passing vertically through these heads and forming a passage from the chamber below the boiler to the space above, which connects with the smoke-stack or chimney.

From the lower portion of the cylindrical
30 boiler-shell A the furnace D extends to one side to a sufficient distance to provide such furnace-space as may be necessary. The furnace is surrounded on top and sides by the usual water-space E, and the outer and inner shells are connected together by stay-
35 bolts, by which they are properly braced.

A chamber F extends from the furnace horizontally beneath the cylindrical portion A and the tubes B of the boiler, and the bot-
40 tom of this cylindrical portion and the space between it and the bottom of the furnace D is lined with fire-bricks or other suitable fire-resisting material, as shown at G, which form a low back to the furnace; but the top is level
45 with the bottom of the chamber F. This lining also prevents so great a heat at the bottom of this portion of the boiler as would create a danger of fire in grain or stubble fields. That portion which is beneath the
50 grate is protected by a water-pan, as shown.

H is the ordinary horizontal grate fixed

within the furnace D, and I are vertical
grates journaled so as to swing upon hinges
(shown at J) at the sides of the space which
they occupy, and they are arranged to latch
55 upon suitable catches K at the central portion where they meet. These vertical grates extend across the rear of the furnace proper and between it and the chamber F beneath
the boiler and the vertical flues. This space
60 F forms what I term a "settler," into which the ashes and débris from the combustion of the light fuel in the furnace are allowed to settle, so as to prevent them from passing up
65 through the flues to be discharged through the chimney. The vertical grates I act to catch and detain the light straw fuel and prevent its being swept into this chamber, and only the burnt cinders from the straw will pass
70 through and over the grates.

Whenever it is desired to clear out the
space F, it is done by simply unlatching the
vertical grates I by means of a rod or hook
and swinging them back against the sides of
the furnace, when all the deposit can be
75 raked out from the space F and the grates closed together again.

This boiler is especially adapted for the purpose of burning straw as a fuel, and in order
to provide for a perfect combustion of the
80 straw I have shown two feed-tubes L, which are fixed to doors opening into each side of the front of the furnace.

In burning straw as a fuel the straw is ignited as soon as it enters the doors and burns
85 from the surface like the wick of a lamp, instead of burning like other fuel from the bottom of the grates upward. Therefore by using the two feed-doors I am enabled to supply a larger surface for combustion and
90 to insure the straw being burned more rapidly and perfectly than if I used but one door. The light straw and cinders therefrom are carried back through the furnace until they strike the intercepting vertical grates I, which
95 prevent the straw from being carried back directly into the chamber F, and insures its nearly complete combustion before it reaches that chamber. The result of this is that
100 nearly the whole of the heat is extracted from the burning straw before it reaches that point, and only the cinders and débris of the straw

will fall into this chamber, and they will thus be prevented from passing out through the flues B, as before described.

Beneath the furnace D is a water-pan M, 5 which extends out in front of the furnace, and all ashes and cinders which fall through the grates H will fall into this pan, and the material which is raked out from time to time from the furnace will fall into the front 10 portion of this water-pan, where it will be extinguished. In order to control the draft through this water-pan, I have shown a grate or door N, hinged so as to fall down across the pan and prevent a draft of air at this 15 point.

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

1. In a boiler having a vertical shell, with 20 tubes passing vertically through the same and communicating with a chamber beneath, a furnace situated at one side and opening directly into said chamber, vertically-arranged pivoted grates extending transversely 25 across said chamber at or near its junction with the back of the furnace, and means for holding the grate in position, substantially as herein described.

2. In a boiler, a vertical tubular shell having the furnace or extension at one side of the 30 lower part and a chamber in line with said furnace and beneath the boiler and its flues, in combination with the vertical grates hinged to the sides within the furnace and capable of swinging outward against the sides of the 35 furnace and a central catch by which these grates are latched and held in position transversely across the space between the furnace and the chamber beneath the boiler, substantially as herein described. 40

3. In a boiler, the vertical cylindrical shell having the interior vertical flues, a chamber beneath said flues, a furnace extending to one side of the boiler in line with said chamber and having the two door-openings pro- 45 vided with the straw-feeding funnels, and the vertical swinging grates hinged between the furnace and the rear chamber, substantially as herein described.

In witness whereof I have hereunto set my 50 hand.

DANIEL BEST.

Witnesses:

WILLIAM W. REID,
GEO. S. SCOTT.