

D. Matthew,
Spark Consumer.
N^o 10,295. Patented Dec. 6, 1853.

Fig. 1.

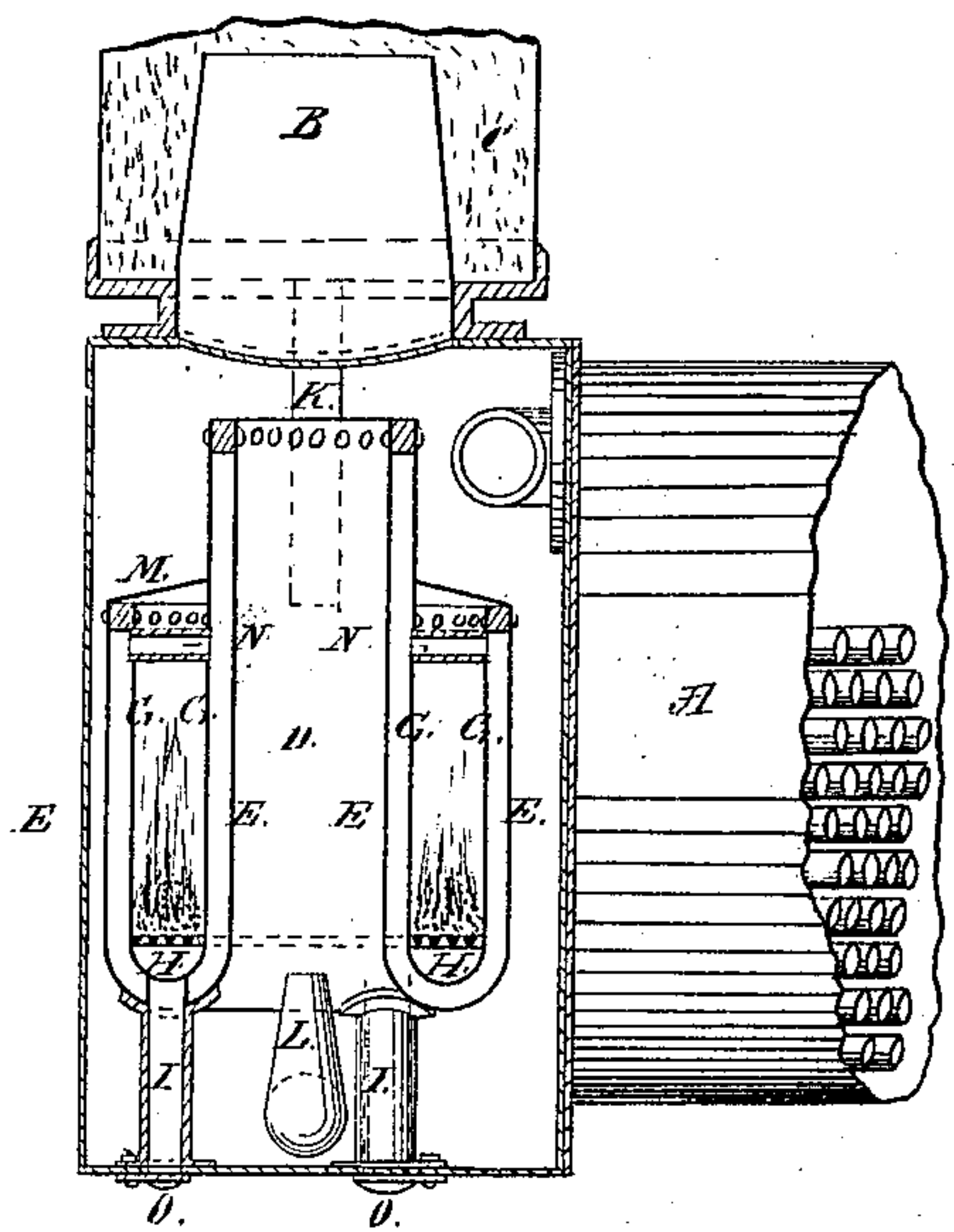


Fig. 2.

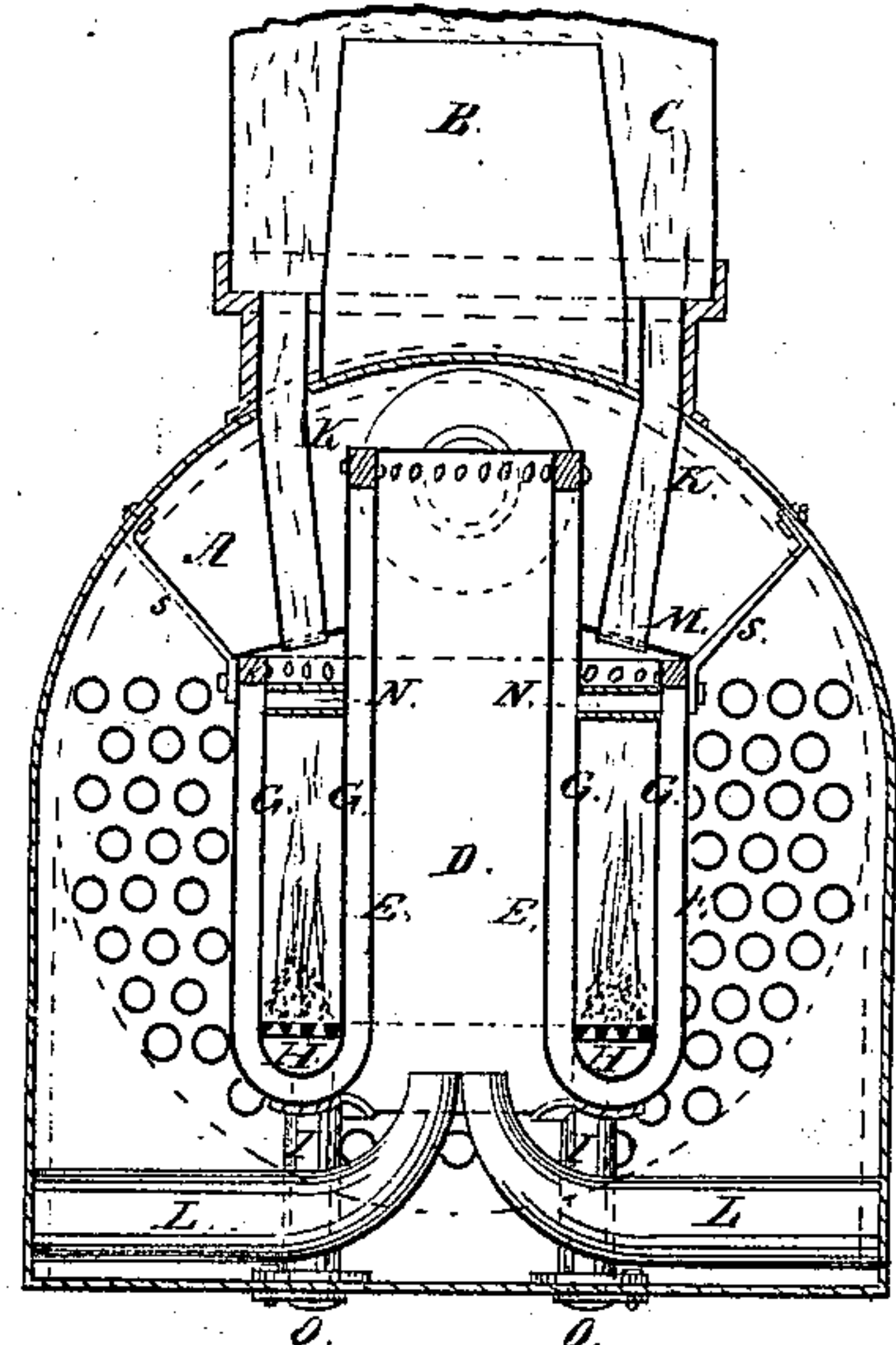


Fig. 3.

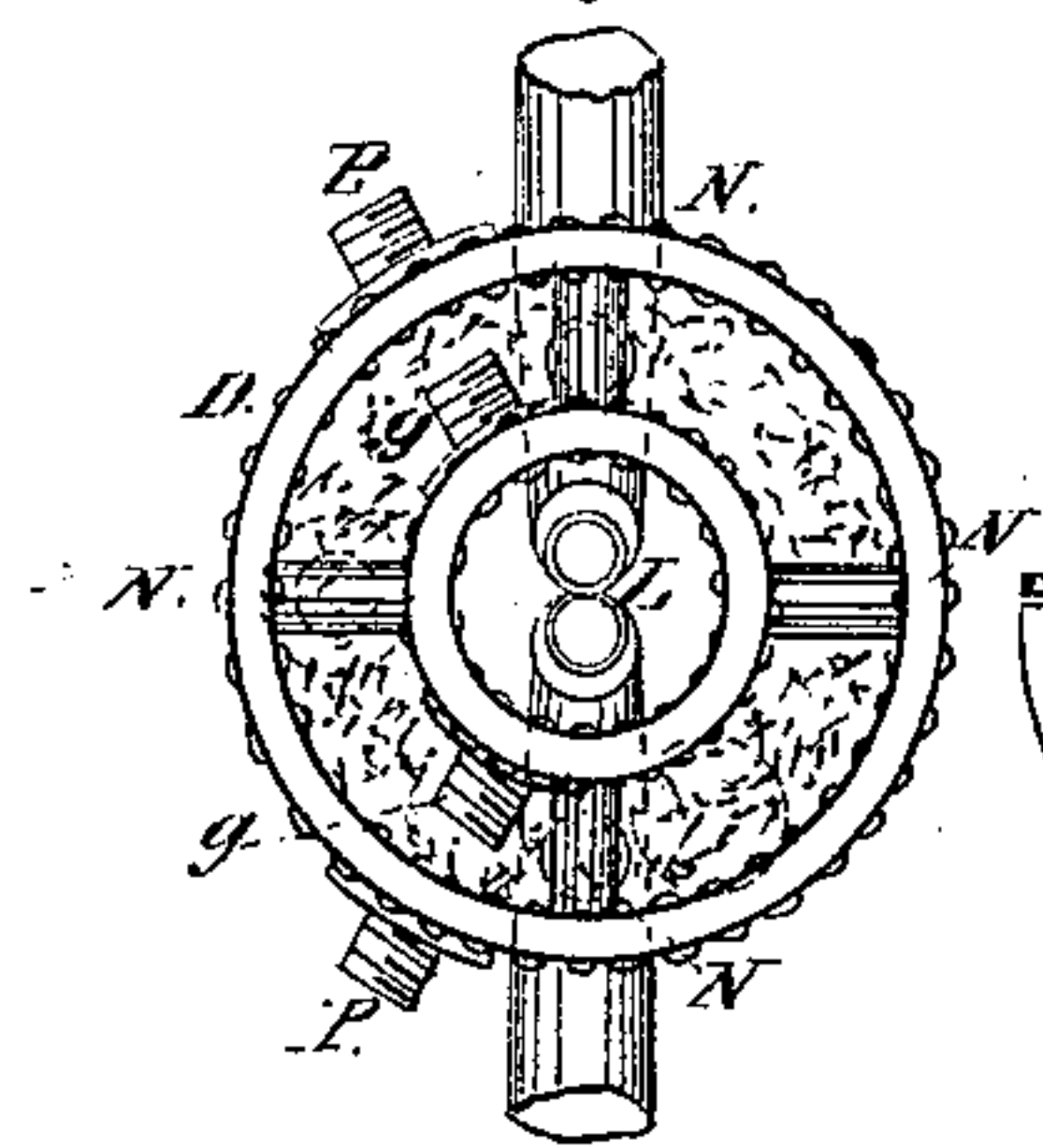


Fig. 4.

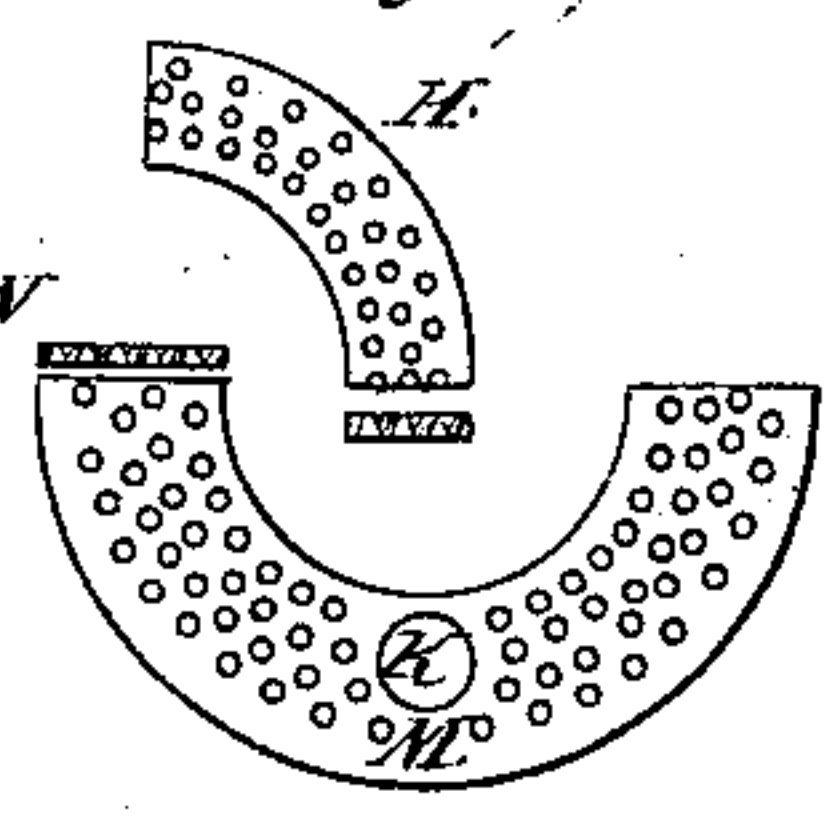
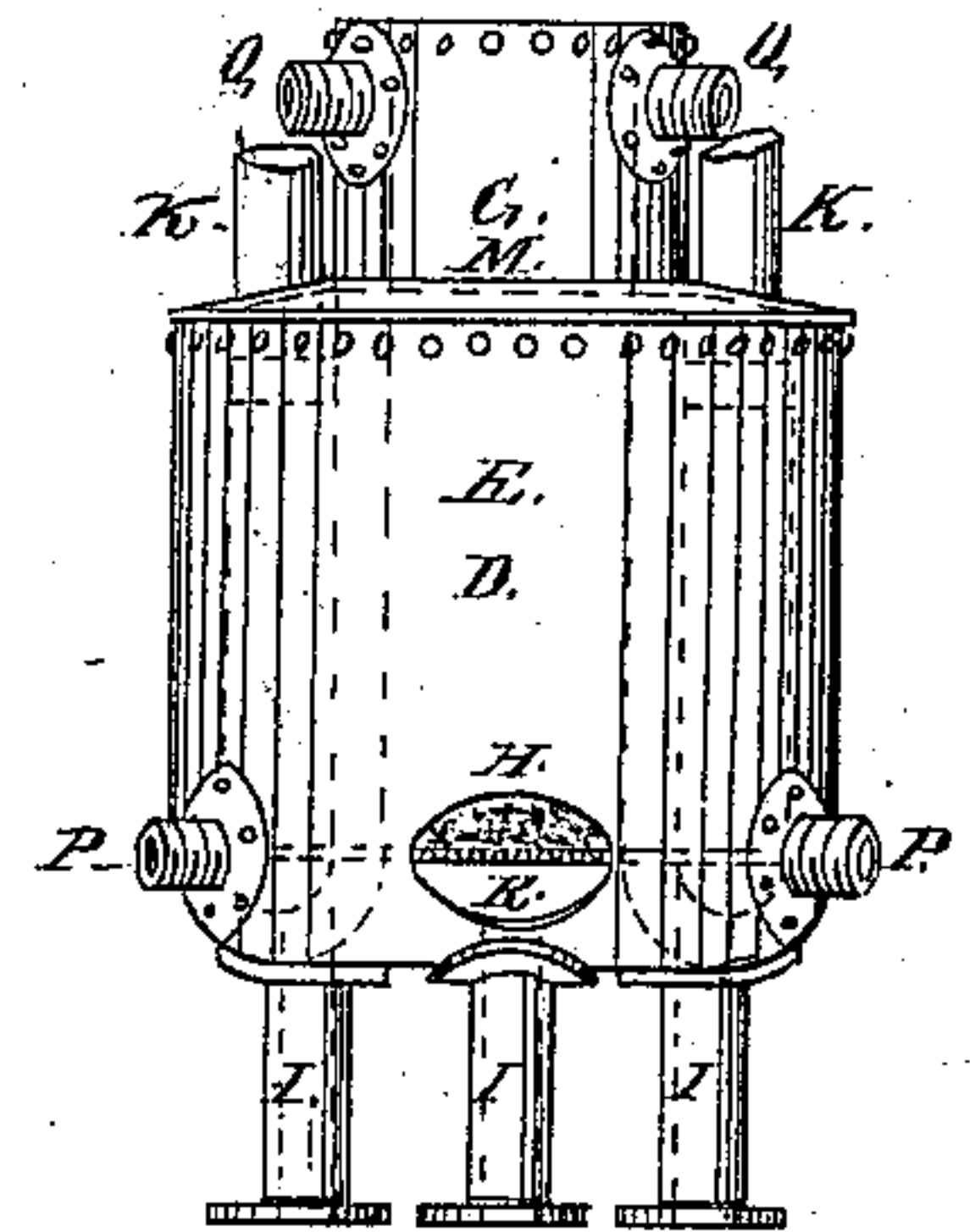


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

DAVID MATTHEW, OF PHILADELPHIA, PENNSYLVANIA.

SPARK-BURNER AND WATER-HEATER FOR LOCOMOTIVES.

Specification of Letters Patent No. 10,295, dated December 6, 1853.

To all whom it may concern:

Be it known that I, DAVID MATTHEW, of the city of Philadelphia, Pennsylvania, have invented a new and useful Combined Spark-
5 Burner and Feed-Water Heater for Locomotive Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings,
10 making part hereof.

The nature of my invention consists in constructing, and providing the engine with, an apparatus which receives and consumes the sparks, presents an inner water sur-
15 face to their fire, an outer and also central water surface to the heat from the flues of the boiler, and heats the feed water in a reservoir or space between these water surfaces for supplying the boiler; by which the
20 sparks are saved and utilized and the generation of steam increased.

In the accompanying drawings like letters refer to like parts, and Figure 1 is a sectional side view through the apparatus in the smoke box. Fig. 2, is a sectional front
25 view of the apparatus in the smoke box. Fig. 3, is a top view of the apparatus with the cover removed. Fig. 4 is a view of half the cover, and one fourth of the grate, detached. Fig. 5 is a side view of the appa-
30 ratus detached from the smoke box.

A is the front part of the locomotive's boiler, showing the flues, and smoke box containing the apparatus D for consuming
35 the sparks and heating the feed water, of which apparatus, E E, E E are inner and outer concentric pipes joined at the bottom by a curved plate ring; and G G, G G are two other concentric pipes joined at the bot-
40 tom by a curved plate ring. The two inner pipes are then connected at the top by riveting through a ring, and the two outer pipes also by riveting through another ring, forming water spaces between these concentric
45 pipes, communicating at the bottom between the curved plate rings, and at the top a communication between the water spaces is formed by four horizontal connecting
50 pipes N, N, N, N. The space between the pipes G G—G G, is the reservoir where the sparks are received and burned up on a perforated plate or grate H H. The air to support combustion is admitted to the sparks,

through three or four vertical pipes I, I, I, which support the apparatus on the bottom
55 of the smoke box. The top of the spark furnace is covered with a perforated plate M, and the sparks are dropped from the spark catcher's reservoir C above, through
60 pipes K, K, secured to this cover, into the spark furnace to be consumed and heat the feed water. The admission of air is regulated into the burner by the valves O, O. The exhaust pipes L, L, discharge up the
65 inner pipe E, E, into the chimney B of the spark catcher. The bottom of the apparatus D should be about twelve inches from the bottom of the smoke box, and the top
70 about four inches from the base of the top arch of the smoke box.

The water is forced into the apparatus by the pumps through the pipes P, P, and enters the boiler head or other part of the boiler through the pipes Q, Q.

This apparatus by means of the exhaust
75 steam will draw the sparks out of the smoke box in the manner described in my patent for "improvements in spark and gas consumers" of 20th February 1849.

The spark catcher and reservoir from
80 which the apparatus in the smoke box receives the sparks may be made in any known manner.

R, Fig. 5 is a hand hole to clean out the apparatus and S S Fig. 2, are stays to
85 brace it.

The sparks fall from the reservoir above through the pipes K into the spark furnace, where they are burnt up. The air passes up
90 through the pipes I, I, I to consume them and out the perforations of the top M and ascends the chimney while the heat derived from them and the flues heats the feed water inside of the water space of the apparatus.

What I claim is—

The arrangement and application of the two concentric pipes, the curved plate rings, the pipes I, I, I, the furnace grate H, the
95 cover M and pipes K, P, Q and N, forming a combined apparatus in the smoke box for
100 burning the sparks and heating the feed water substantially as described.

DAVID MATTHEW.

Witnesses:

JOEL COOK,
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