No. 744,042. PATENTED NOV. 17, 1903.

P. BURK.

LOCOMOTIVE STEAM BOILER.

APPLICATION FILED FEB. 4, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

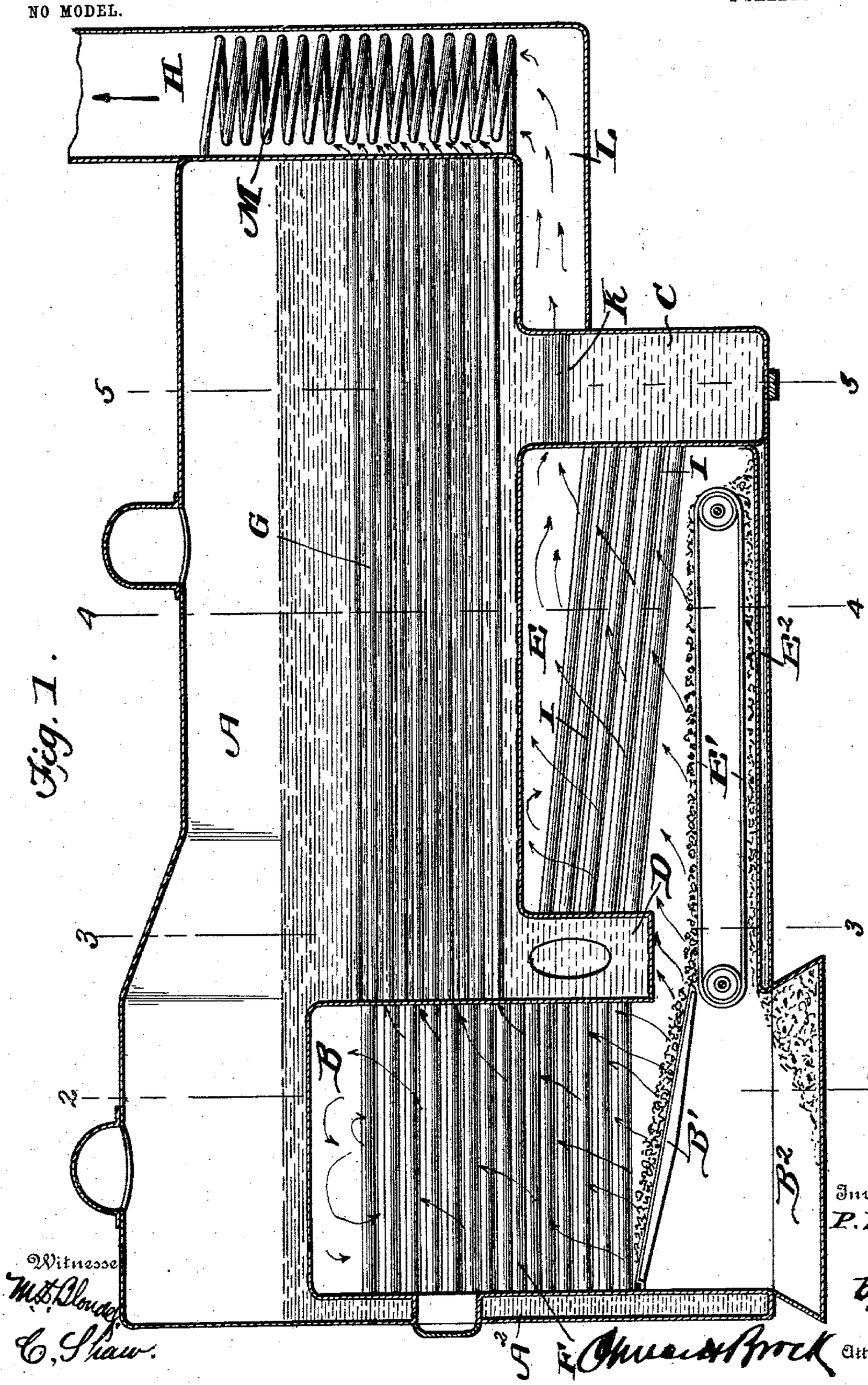

Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

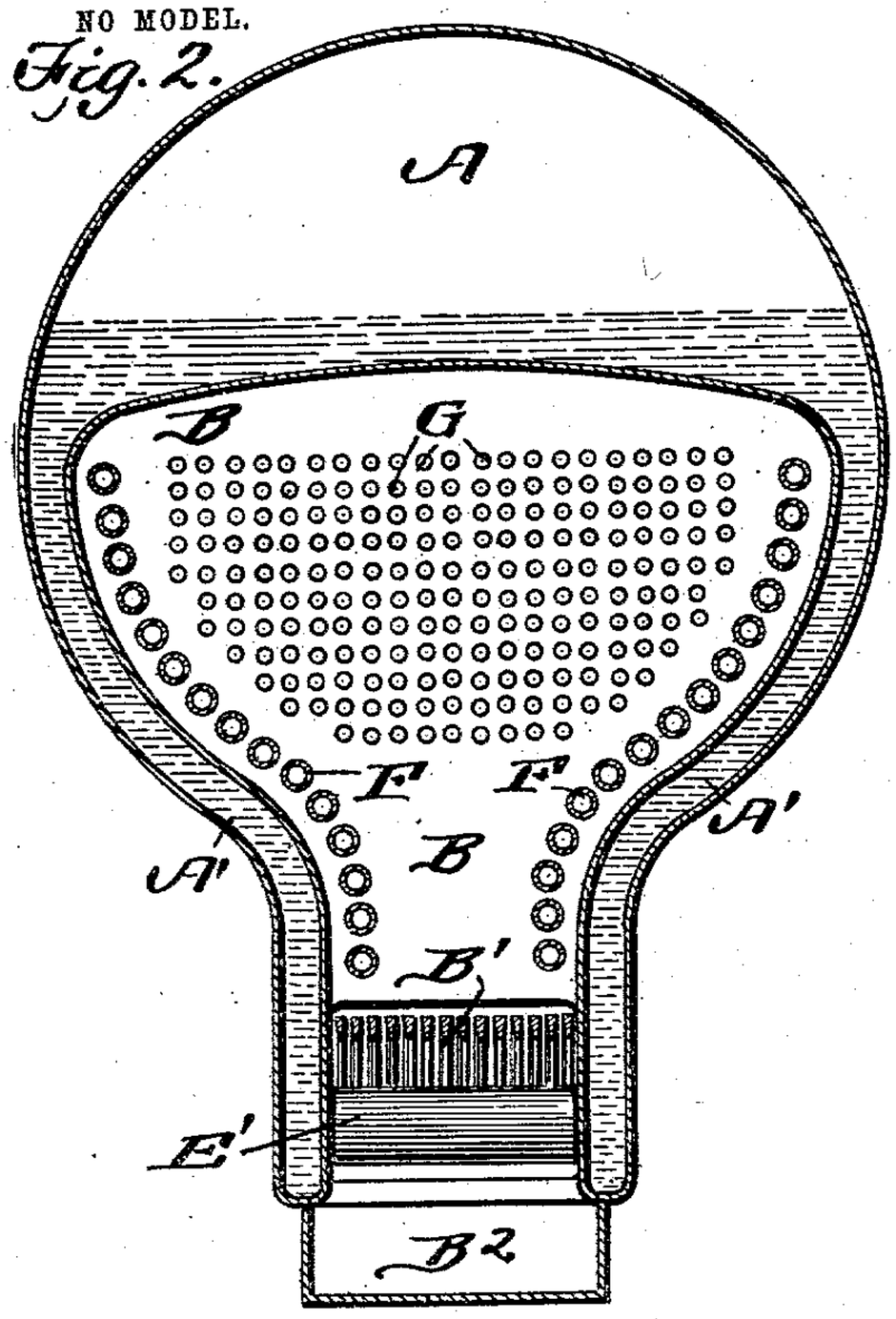


Fig. 5.

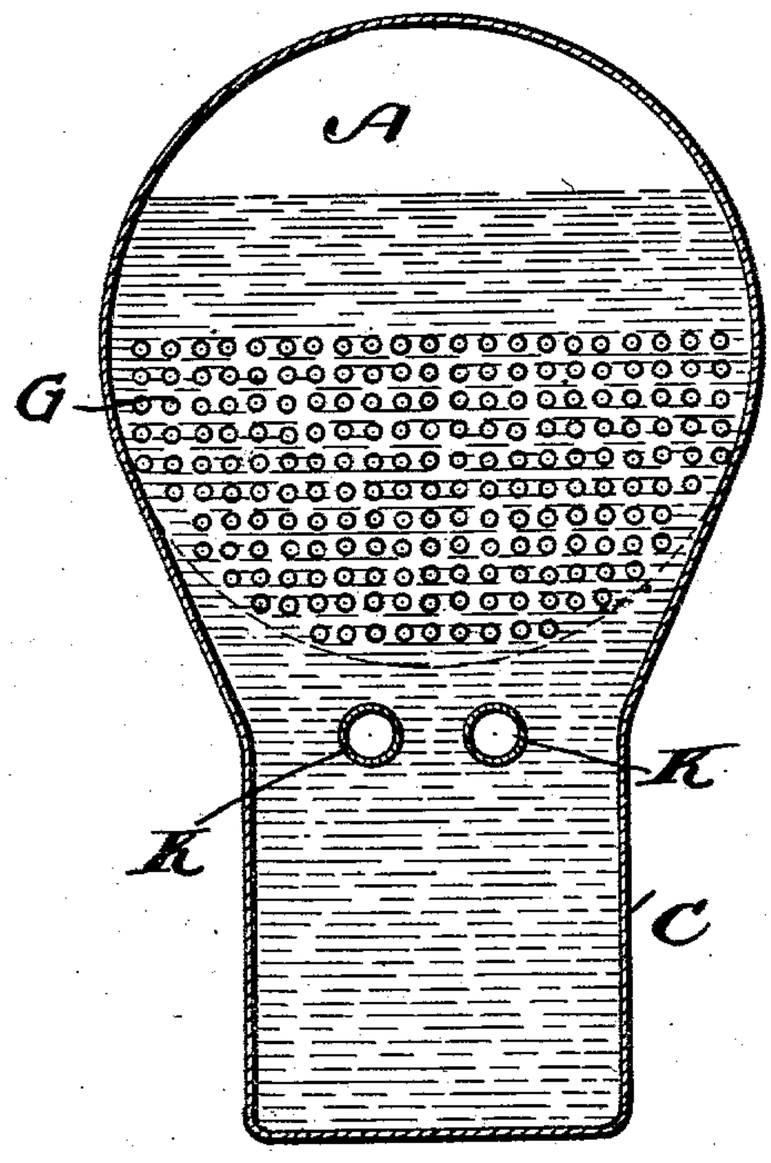
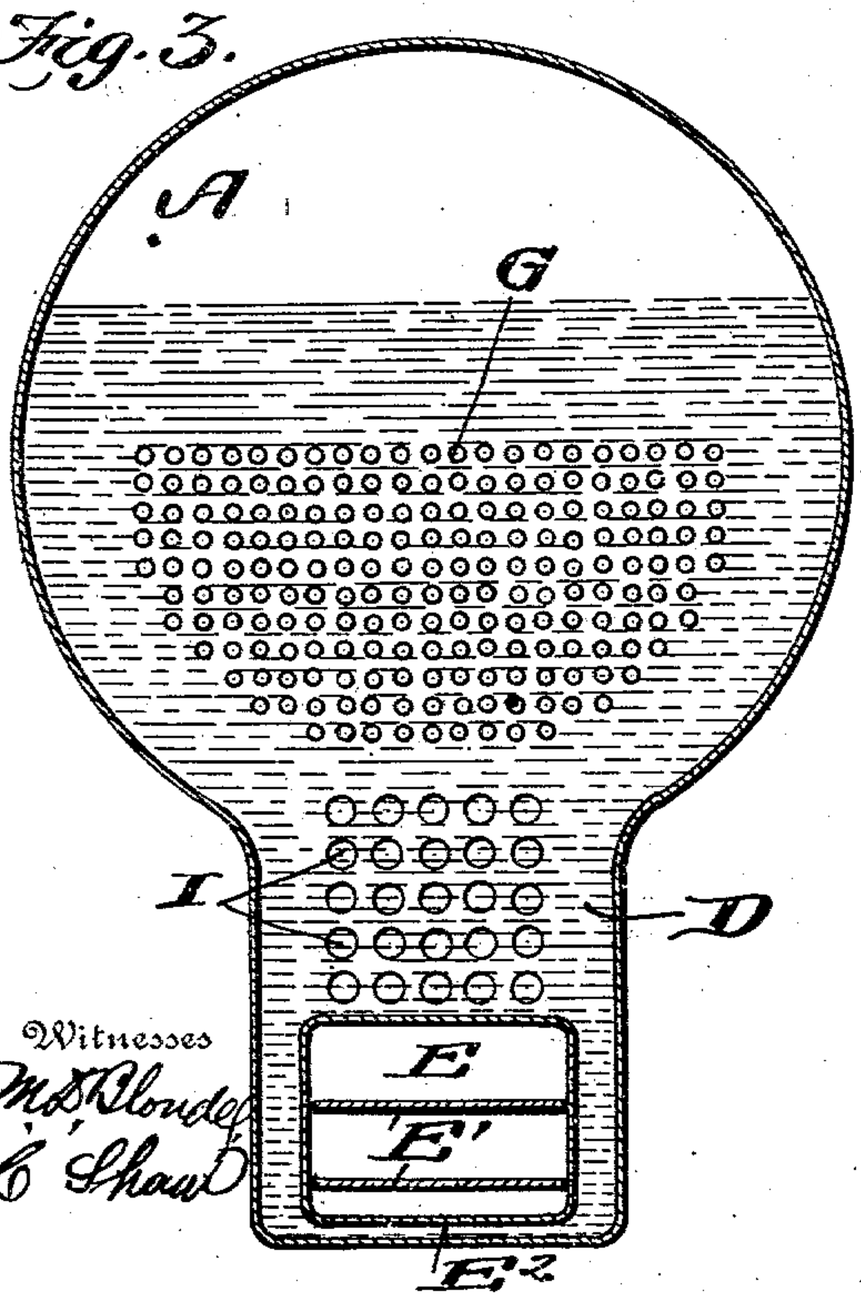


Fig. 3.



Witnesses
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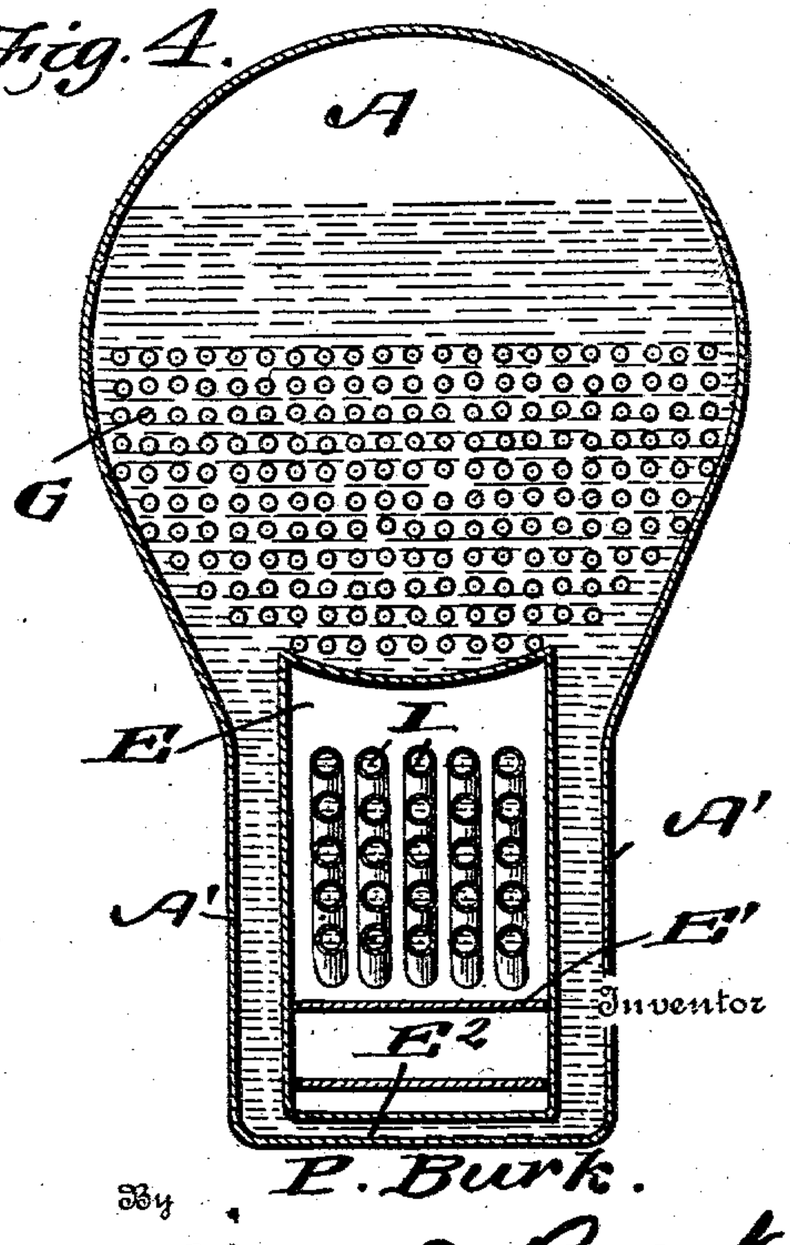
Fig. 4.



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No. 744,042. Patented November 17, 1903.

UNITED STATES PATENT OFFICE.

PATRICK BURK, OF CANTON, OHIO.

LOCOMOTIVE STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 744,042, dated November 17, 1903.

Application filed February 4, 1903. Serial No. 141,877. (No model.)

To all whom it may concern:

Be it known that I, PATRICK BURK, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Improvement in Locomotive Steam-Boilers, of which the following is a specification.

This invention relates generally to steam-boilers, and more particularly to an improved construction of locomotive-boilers, the object being to provide a boiler in which steam can be quickly and easily generated, one in which products of combustion are utilized for the purpose of heating the feed-water, and one in which the main and secondary fire-chambers are protected by means of water-jackets.

Another object of the invention is to provide a locomotive-boiler in which main and secondary fire boxes or chambers are employed, thereby utilizing all of the heating units obtainable from a given quantity of fuel.

With these and certain other objects in view the invention consists in the novel features of construction, combination, or arrangement, all of which will be fully described hereinafter, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a vertical longitudinal sectional view of a locomotive-boiler constructed in accordance with my invention. Fig. 2 is a transverse vertical section on the line 2 2 of Fig. 1. Fig. 3 is a transverse vertical section on the line 3 3 of Fig. 1. Fig. 4 is a transverse vertical section on the line 4 4 of Fig. 1, and Fig. 5 is a transverse vertical section on the line 5 5 of Fig. 1.

Referring to the drawings, A indicates the boiler, having main fire box or chamber B arranged, as usual, at the rear end thereof, said fire box or chamber being protected upon the sides by means of the water-jacket A′ and at the rear by the water-jacket A^2. The boiler is constructed with a depending water-leg C, adjacent to the forward end, and an intermediate depending water-leg D, which is arranged at the forward side of the main fire box or chamber, thereby providing a secondary fire box or chamber E between the depending water-legs D and C. The fire-box B is provided with a forwardly and downwardly inclined grate B′, and an endless horizontal movable grate E′ is arranged in the bottom of the secondary fire box or chamber E. The fire-box B is also provided with water-tubes F, arranged upon opposite sides of said fire-box and connecting the water leg or jacket A^2 with the main portion of the boiler. The boiler is provided with a series of fire-tubes G, which extend from the fire-box B to the smoke-stack H. The depending legs C and D are connected by means of a series of water-tubes I, said tubes being inclined, as shown, and in the upper end of the leg C are two fire-tubes K, through which the products of combustion pass from the secondary fire-box E into the smoke-box L, said smoke-box communicating with the smoke-stack at the lower end. A coil-pipe M is arranged in the smoke-stack H and is connected at its lower end to the lower portion of the boiler and at its upper end to the upper portion of the boiler. The feed-water is introduced into this coil and becomes heated by the escaping products of combustion and after being so heated is introduced into the boiler at any desired point. The bottom of the secondary fire-chamber E is protected by means of a water-jacket E^2, which is in communication with the depending leg C and with the side legs or water-jackets of the boiler A′.

In operation the fuel is placed upon the inclined grate B′ and ignited. The products of combustion pass through the fire-tubes G and also under the water-leg D, between the water-tubes I, and out through the fire-tubes K, smoke-box L, and smoke-stack H. Fuel also passes to the movable horizontal grate E′, which is moved by any suitable mechanism, and the fuel is then carried the full length of the secondary fire box or chamber E, and the thoroughly-combusted fuel is carried out and dumped into the ash-chamber B^2 by means of the lower flight of the endless grate E′. It will thus be seen that all of the heat units obtainable from a given quantity of fuel are utilized, and it will also be noted that these heat units are utilized in a manner to produce the maximum effect upon the water to be heated, owing to the peculiar construction and arrangement of the water legs and tubes.

The depending water-legs will be provided with the usual or any approved construction of hand-holes.

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

1. A locomotive-boiler having main and secondary fire-boxes, a depending water-leg between said fire-boxes, a depending water-leg forming the front wall of the secondary fire-box, downwardly-inclined water-tubes connecting the depending legs and fire-tubes passing through the last-mentioned depending water-leg.

2. A locomotive-boiler having main and secondary fire-boxes, the depending water-legs arranged, as described, the forward leg having fire-tubes arranged therein adjacent to the upper end, the water-tubes connecting the depending legs, the inclined grate arranged in the main fire-box, the horizontally-movable grate arranged in the secondary fire box or chamber, the smoke-box, smoke-stack and water-heating coil arranged in the smoke-stack and communicating with the boiler, substantially as described.

3. A locomotive-boiler having main and secondary fire boxes or chambers, the water-tubes arranged upon opposite sides of the main fire-box, the depending water-leg arranged intermediate the fire-boxes, the front water-leg arranged adjacent to the forward end of the boiler, and having fire-tubes arranged adjacent to its upper end, the smoke box and stack, the water-heating coil arranged in the smoke-stack, the inclined water-tubes connecting the depending water-legs, the endless horizontally-movable grate arranged in the secondary fire-box, and the inclined grate arranged in the main fire-box, substantially as shown and described.

PATRICK BURK.

Witnesses:
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