

No. 684,444.

Patented Oct. 15, 1901.

W. W. LOWE.
SMOKE CONSUMER.

(Application filed June 29, 1901.)

(No Model.)

Fig. 1.

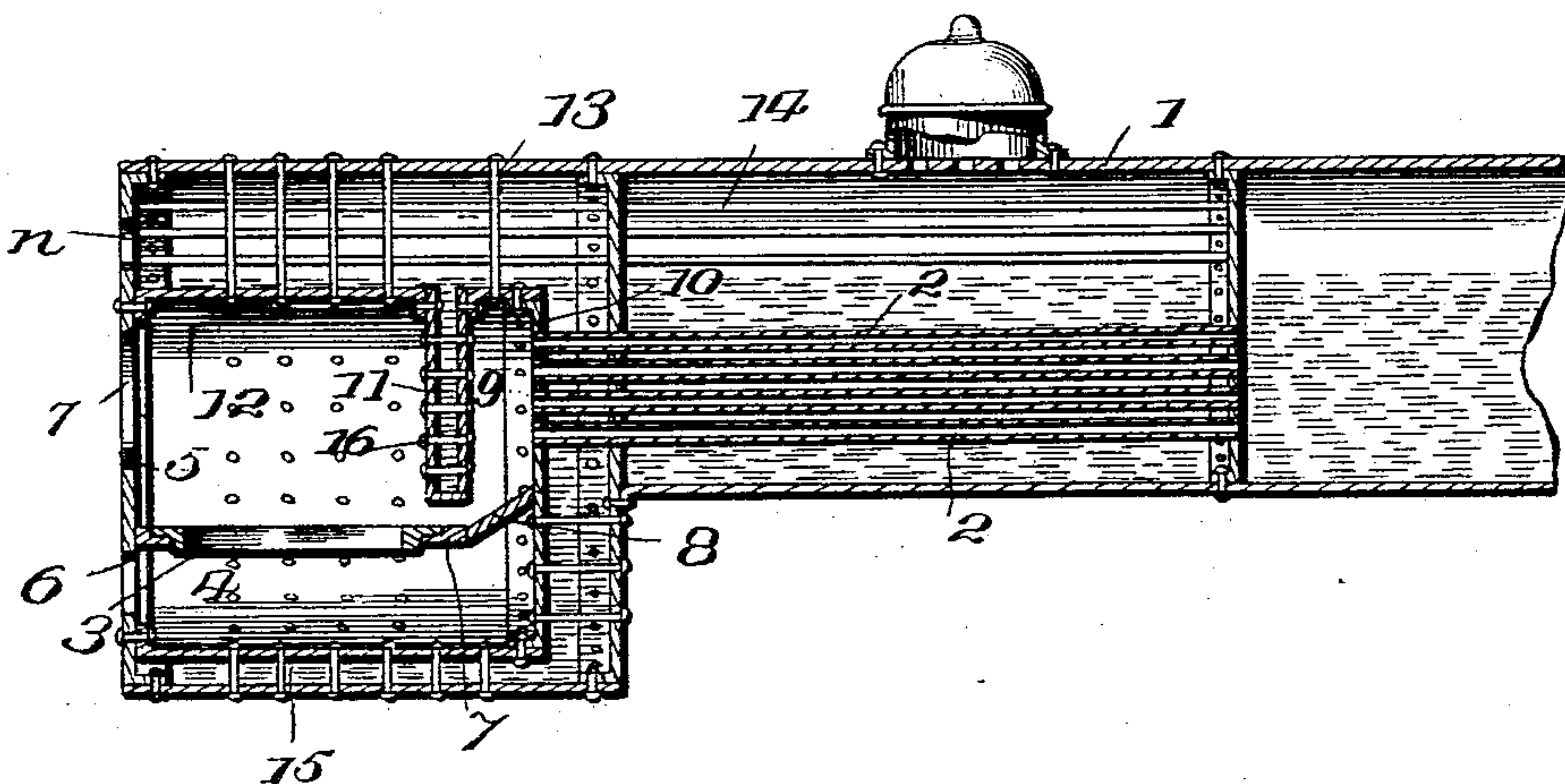
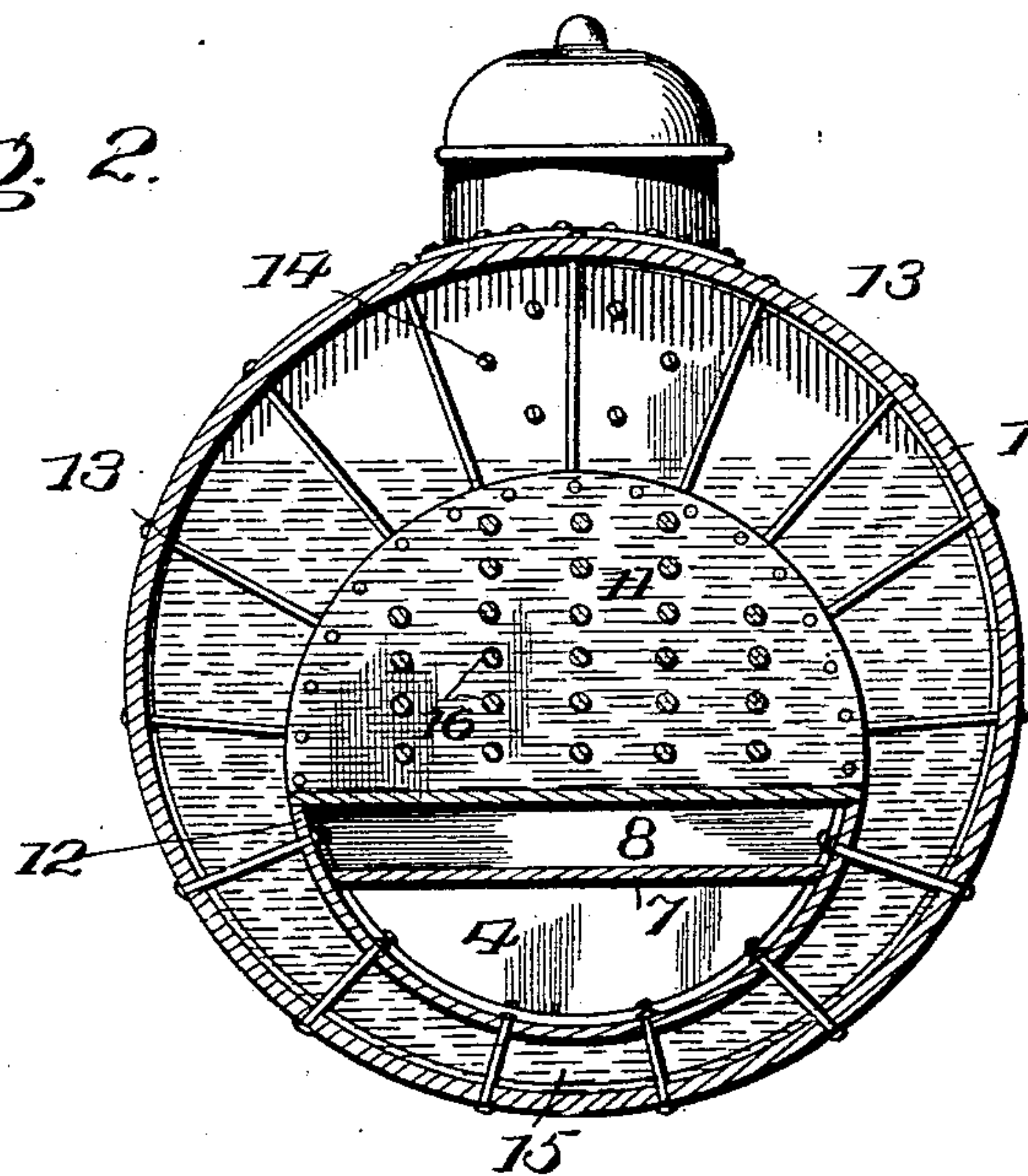


Fig. 2.



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Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM W. LOWE, OF EARLY, IOWA.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 684,444, dated October 15, 1901.

Application filed June 29, 1901. Serial No. 66,511. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. LOWE, a citizen of the United States, residing at Early, in the county of Sac and State of Iowa, have
5 invented certain new and useful Improvements in Smoke-Consumers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which
10 it appertains to make and use the same.

My invention has relation to boilers, and, while useful and desirable for almost any variety of boiler, will be especially applicable to that form of boiler wherein the grates of
15 the fire-box are disposed slightly below the line of the boiler-tubes.

The prime object of my invention is to not only increase the rapid generation or production of steam, but also to insure that an
20 absolutely perfect combustion will take place, thereby producing a spark-arrester and smoke-consumer of reliable efficiency.

Other objects and advantages will be made clearly apparent from the following specification, which will be considered in connection with the accompanying drawings, made a part thereof.

Figure 1 of the drawings illustrates a longitudinal central section of a boiler and fire-box, showing my invention applied to use.
30 Fig. 2 is a transverse section of Fig. 1 on line *a a*, showing a slightly-enlarged scale.

In order to conveniently refer to the elements of my invention and the accessories
35 designed to cooperate therewith, numerals will be employed, the same numeral designating a similar part throughout the views.

Briefly stated, my invention comprehends the combination of a water-leg or water-
40 pocket designed to depend into the fire-box and a spark-arrester plate so arranged that the smoke and products of combustion will be directed upward into a combustion-chamber provided between the tube and the wa-
45 ter-leg.

Referring in detail to the drawings, 1 indicates the casing of the boiler, which may be constructed in substantially the usual or any preferred manner and is provided with
50 a plurality of flues 2, as is common, adapted to direct the products of combustion to the

smoke-stack. Suitable grate-bars 3 of the usual or any preferred construction are provided and located so as to divide the combustion-chamber into the ash-receptacle 4
55 and the fire-box 5, said grates being supported in any preferred way, as upon the ledge 6 and dead-plate or cross-bar 7, said plate being preferably disposed directly beneath the water-leg. The dead-plate 7 is so formed
60 upon its inner edge that it will be provided with the upwardly-inclined section 8, the "dead-plate" being so termed by reason of the fact that it is not provided with any slots or perforations, the inclined portion 8 being de-
65 signed to direct the smoke upward into the combustion-chamber 9, which is located between the tube-sheet 10 and the water-leg 11, said leg comprising a pocket which is open at the top and sides, and thus communicates
70 with the interior of the boiler, and is always filled with water when the latter is in sufficient quantities to cover the crown-sheet 12. By looking at the water-leg as presented in
75 Fig. 2 it will be observed that it is semicircular in outline, the upper edges being properly connected to a contiguous part of the crown-sheet and suitably riveted thereto, as indicated in Fig. 1. The crown-sheet and the
80 upper portion of the boiler are properly reinforced and sustained by the radially-disposed rods or rivets 13, the boiler being longitudinally supported by the rods 14, the ends of which are properly secured, as by upsetting the same after extending through suitable
85 apertures in the boiler-casing. I prefer to form the boiler so that there will be an annular chamber around the combustion-chamber, the water filling the space 15 below the ash-box. I also reinforce the walls of the
90 water-leg by means of the rivets 16, extending through suitable apertures in each wall and having the ends thereof upset, as is usual. It will be understood that the dead-plate 7
95 and the inclined portion thereof 8 may be so formed as to provide the required amount of dead-surface, and when the water-leg is disposed directly above the plate 7, as shown in Fig. 1, the line of draft must necessarily
100 extend under the lower edge of the water-leg before reaching the flues, and that since the point of combustion 9 for the smoke, &c.,

will show an intense heat the smoke will be entirely consumed before entering the flues, while the ash from the sparks, &c., will fall upon the dead-plates 7 and 8. A suitable opening 17 is provided for the fire-box, said opening being preferably so located that the fire will be below the line of draft, thereby insuring that said line of draft will pass over the top of the fire and carry with it the smoke and other products of combustion under the water-leg and thence into the combustion-chamber 9, as above described.

While I have described the preferred combination and construction of parts deemed necessary in materializing my invention, I desire to comprehend in this application all substantial equivalents and substitutes that may be considered to fall fairly within the scope and purview of my invention.

Believing that the construction and manner of using my invention have been made clearly apparent from the foregoing specification, considered in connection with the accompanying drawings, further reference to the details is deemed unnecessary.

Having thus fully described my invention,

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

The herein-described smoke and gas consuming attachment for boilers comprising a combustion-chamber having a fire-box and ash-receptacle, grate-bars separating said fire-box and ash-pit, a dead-plate 7 designed to support the inner ends of the grate-bars and having the upwardly-inclined section 8 in combination with a water-leg depending from the crown-sheet and open at the top and thereby communicating with the interior of the boiler, said leg being disposed downward into close juxtaposition to said dead-plate whereby the smoke, gases or the like will be directed under the lower edge of the water-leg and thence into the combustion-chamber 9 before entering the flues of the boiler all combined substantially as specified and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM W. LOWE.

Witnesses:

W. E. HARDEN,
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