No. 662,882. Patented Nov. 27, 1900.

L. D. SHAW.

STEAM GENERATOR.

(Application filed Sept. 17, 1900.)

(No Model.)

Fig. 1.

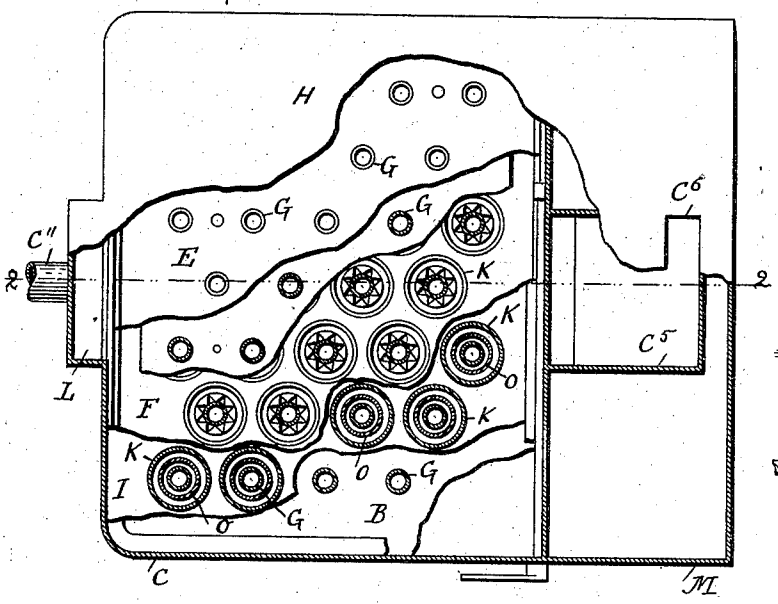


Fig. 3.

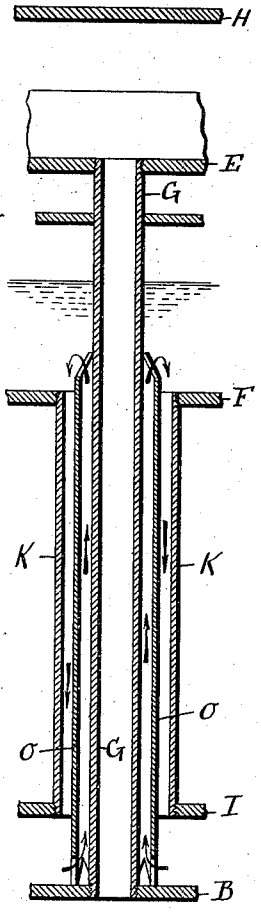
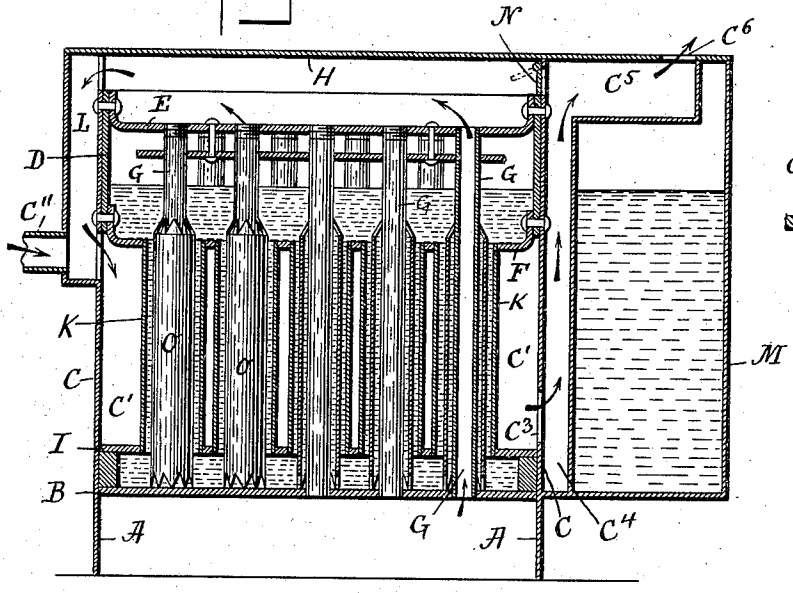


Fig. 2.



Witnesses=

Charles F. Logan.

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Inventor=

Loring D. Shaw.

by Albert G. Davis Atty.

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UNITED STATES PATENT OFFICE.

LORING D. SHAW, OF CHELSEA, MASSACHUSETTS, ASSIGNOR OF THREE-EIGHTHS TO THOMAS W. GOWEN, OF MALDEN, MASSACHUSETTS.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 662,882, dated November 27, 1900.

Application filed September 17, 1900. Serial No. 30,226. (No model.)

To all whom it may concern:

Be it known that I, LORING D. SHAW, a citizen of the United States, residing at Chelsea, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Steam-Generators, of which the following is a specification.

This invention relates to improvements in steam-generators, and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a top plan view showing parts removed and in section. Fig. 2 represents a vertical section on the line 2 2 shown in Fig. 1, and Fig. 3 represents an enlarged detail vertical section of one set of the vertical tubes.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In the drawings, A represents the fire-pot or furnace, as is common in steam-generating devices. The boiler is composed of the bottom plate B, secured in a suitable manner to the vertical sides C C of the exhaust-chamber C′, which is connected by means of a pipe C″ to the exhaust from the steam-engine. To the interior of the upper portion of the shell C is secured the steam-boiler D, and to it are secured the horizontal plates E and F, as shown in the drawings.

G G are a series of tubes attached in their lower and upper ends to the plates B and E, and they serve to conduct the heated products from the furnace A through said tubes and into the inclosed smoke-chamber H, arranged above the plate E, as shown in Fig. 2.

Above the plate B is secured the horizontal plate I, which is connected to the plate F by means of a series of water-containing tubes K K, as shown.

From the smoke-chamber H leads a conduit L to the exhaust-chamber C′, and from the opposite end of the latter is made an opening C^3, leading to a conduit C^4, the upper end of which terminates as a chamber C^5, having an opening C^6, through which the gaseous products from the furnace are exhausted. Such opening C^6 may be connected to a smoke-flue or chimney in any well-known manner.

M in Figs. 1 and 2 represents a feed-water heater containing water which is heated previous to being fed into the boiler, as is common in devices of this kind.

N is a valve or gate adapted to close and open a passage leading from the smoke-chamber H to the chamber C^5. By closing said valve or gate, as shown in Fig. 2, the gaseous products from the chamber H are caused to pass through the chamber C′ around and between the water-containing tubes K K, thus additionally heating the water contained in the boiler-tubes K K.

If it is desired to have a direct draft from the smoke-chamber H to the smoke-exhaust C^6, it is only necessary to open the gate or valve N, as shown in dotted lines in Fig. 2.

For the purpose of causing a proper circulation of water in the tubes K, I prefer to arrange around each tube G an annular deflector-tube O, open at its upper and lower ends and adapted to rest upon the lower boiler-plate B, as shown in the drawings, by which arrangement the water in the lower portion of the boiler will rise in the space between the exterior of each tube G and interior of the deflector-tube O and flow downward between the exterior of the latter and the interior of the tube K, as shown by arrows in Fig. 3, thus establishing a proper circulation of the water in the boiler from its upper to its lower portion, and vice versa, for the purpose of rapidly producing steam.

By injecting exhaust-steam into the chamber C′ with the heated products from the smoke-chamber H the sound of the steam-exhaust is muffled, making the boiler particularly well adapted for automobiles or engines for similar purpose where absence of noise is desired.

What I wish to secure by Letters Patent and claim is—

1. In a steam-generator, in combination a series of heater-tubes G, leading from the fire-pot to a smoke-chamber a series of water-tubes surrounding said heater-tubes and a series of open-ended deflector-tubes O, arranged in the annular spaces between the heater-tubes and water-tubes substantially as and for the purpose set forth.

2. In a steam-generator in combination, a

series of heater-tubes leading from the fire-pot to the smoke-chamber a series of water-tubes leading from the upper and lower water-spaces and surrounding the said heater-tubes, a heater or exhaust chamber in which said water and heater tubes are arranged, a conduit connecting said smoke-chamber and exhaust-chamber with the steam-exhaust and a valve or gate for direct or indirect exhaust of the heated products from the furnace substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LORING D. SHAW.

Witnesses:
ALBAN ANDRÉN,
LAÜRITZ N. MÖLLER.