W. LOWE.

STEAM-GENERATOR.

No. 193,526. Patented July 24, 1877.

Fig. 1.

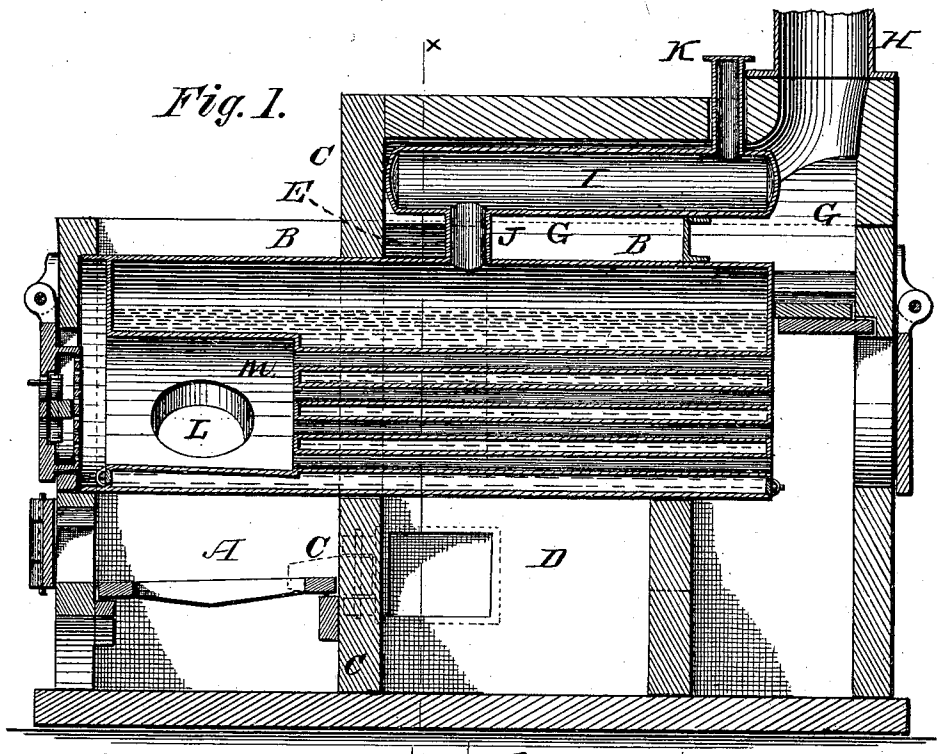
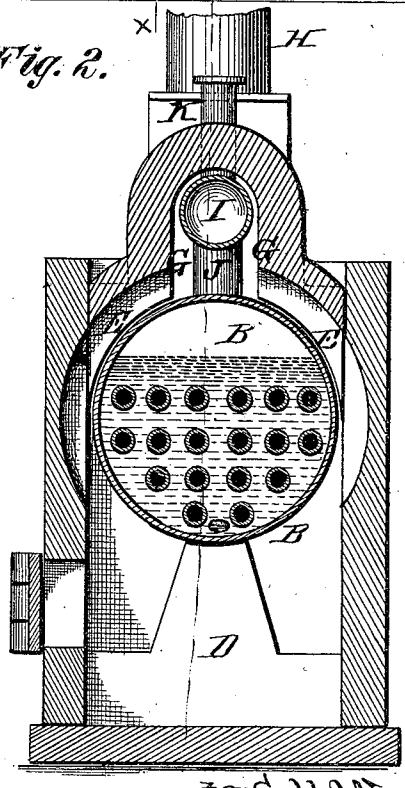


Fig. 2.



Witnesses:

P. C. Dieterich

Frank H. Duffy

Inventor:

William Lowe.

per C. H. Watson & Co Attorneys.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM LOWE, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **193,526**, dated July 24, 1877; application filed July 2, 1877.

To all whom it may concern:

Be it known that I, WILLIAM LOWE, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Steam-Superheater and Fuel-Economizer; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention has for its object to save fuel through the medium of dry and superheated steam, said steam being dried and superheated by the waste heat passing from the boiler, in the manner hereinafter described.

The economy of fuel is obtained by drying and superheating the steam, and preventing unevaporated water from passing out of the boiler with the steam to the engine, or for other uses. If the steam is dry, the boiler requires less water to do its work, and if superheated, still less. It is a well-known fact that the temperature of the heated gases coming from a boiler that is doing a satisfactory amount of work is much above that of the steam at boiler-pressure, and it is rarely found down to that of the steam, so that under very small duty from the boiler the steam can be dried by this process, and superheated when the boiler duty is high. Therefore, this invention is valuable as a fuel-economizer to a greater or less extent, according to the duty required from the boiler, it being the greatest when the boiler is forced and wasting most fuel.

My invention consists of a cylindrical or other suitably-shaped steam drier and superheater, connected with the boiler, and inclosed in a flue that leads to the chimney, together with an arrangement of smoke-chamber and uptake-flues, hereinafter more fully described.

In the annexed drawing, which fully illustrates my invention, Figure 1 is a central vertical section; and Fig. 2, a transverse vertical section on line *x x*, Fig. 1.

A represents the furnace, and B the boiler. This boiler is of such construction as to allow the products of combustion to pass from the furnace, through an auxiliary combustion-chamber, *m*, to the tubes or flues of the boiler.

C is the rear wall of the furnace A, which is built close up to the boiler, leaving no throat or passage. D is a smoke-chamber under the boiler; and at the front end of this chamber immediately in rear of the wall C, are two vertical uptake-flues, E E, one on each side of the boiler, which connect the smoke-chamber D with a flue, G. The flue G, in this case, is formed over the top of the boiler, and leads to the chimney H, as shown. I is the superheater, made in cylindrical or other suitable form, placed in the flue G, and connected with the boiler B at one end by the pipe J. K is the steam-outlet pipe at the other end. The superheater I may be made of cast-iron, steel, or other suitable material.

The products of combustion from the fire first pass through flues or holes S in the bottom of the boiler into an auxiliary combustion-chamber, *m*, thence through tubes or flues of the boiler B, and then downward into the chamber D beneath the boiler; thence through the uptake-flues E on each side, into the flue G, where they envelop the superheater I, and thence out through the chimney H. By this means dry or superheated steam will be furnished without additional expenditure of fuel. The heat which would otherwise pass into the chimney unused is utilized, and a consequent saving of fuel obtained.

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

1. In a superheating steam-boiler, the combination, with the fire-box, of the auxiliary combustion-chamber *m*, located immediately over said fire box, and in front of the tubes, the smoke-chamber D, conduit E, and superheater I, arranged within the uptake-chambers G, substantially as and for the purpose set forth.

2. The combination, in a steam-boiler, of the fire-box A, flues L, connecting said fire-box with the auxiliary-combustion chamber *m*, return smoke-chamber D, and uptake conduit-flues E and G, constructed and arranged substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM LOWE.

Witnesses:
F. P. NORMAN,
D. B. CLUTE.