(No Model.)

J. B. BOSSLER & S. D. STAUFFER.

STEAM GENERATOR.

No. 433,442. Patented Aug. 5, 1890.

Fig. 1.

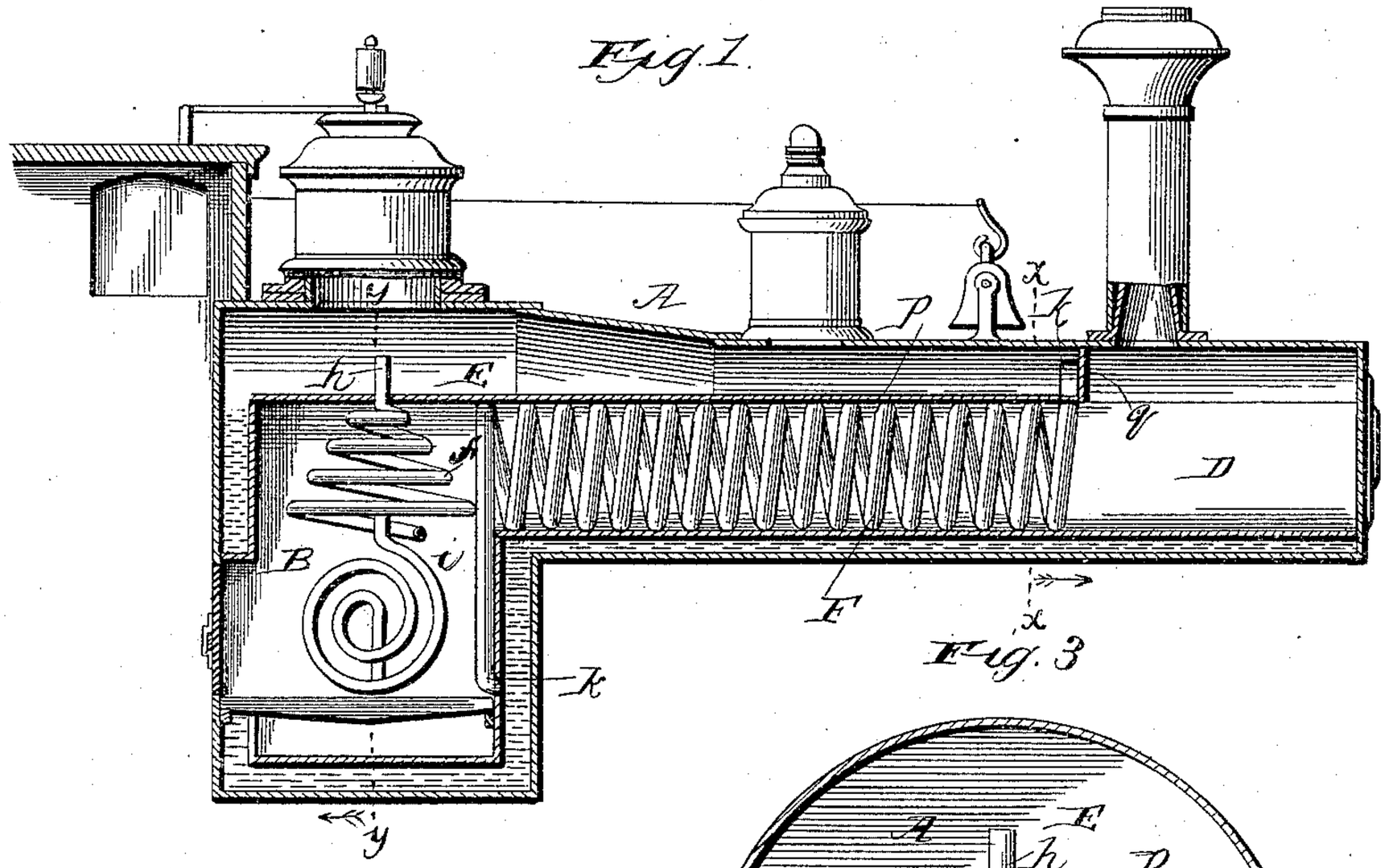


Fig. 3

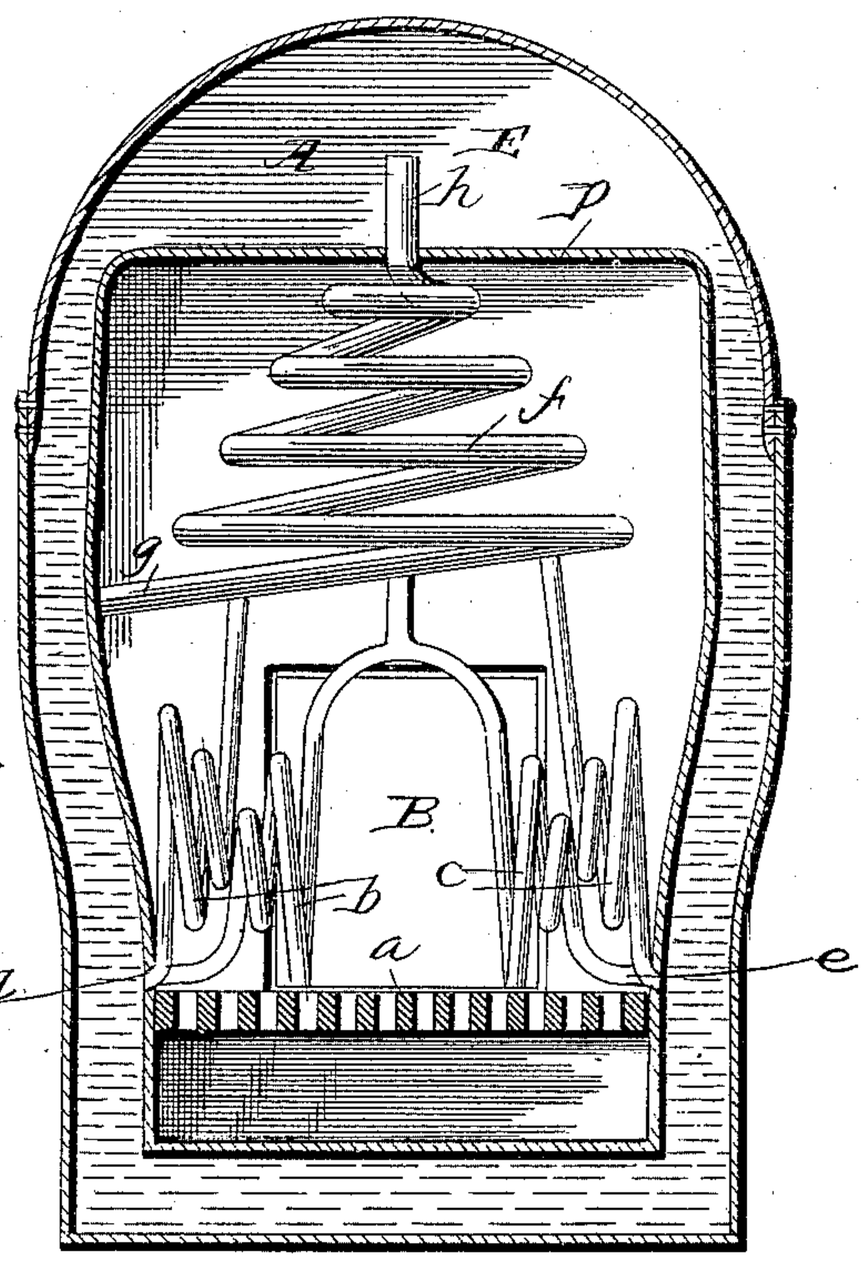
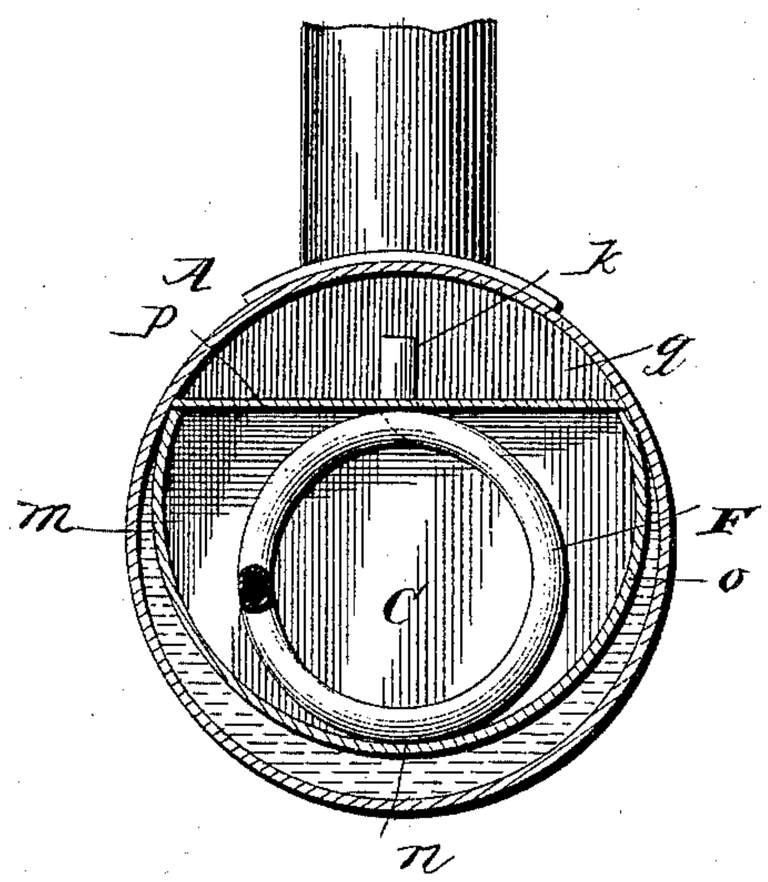


Fig. 2



Witnesses
Geo. C. Hodges
L. B. Whitaker.

Inventor:
J. B. Bossler
S. D. Stauffer
By Johnston, Reinhart & Dyer
Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH B. BOSSLER, OF MIDDLETOWN, AND SAMUEL D. STAUFFER, OF MARIETTA, PENNSYLVANIA.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 433,442, dated August 5, 1890.

Application filed November 29, 1889. Serial No. 331,934. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH B. BOSSLER, residing at Middletown, in the county of Dauphin, State of Pennsylvania, and SAMUEL D. STAUFFER, residing in Marietta, in the county of Lancaster and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Steam-Generators; and we 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 it appertains to make and use the same.

Our invention relates to steam-generators, and has for its object certain improvements in construction whereby steam may be generated with great rapidity and fuel economized.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 represents a vertical longitudinal section of a locomotive-boiler provided with our improvement; Fig. 2, an enlarged transverse section on the line *x x*, and Fig. 3 a similar view on the line *y y*.

Reference being had to the drawings and the letters thereon, A indicates a boiler; B, the furnace thereof; C, the combustion-chamber, and D the uptake. When solid fuel is used, the furnace is provided with a grate *a* of ordinary construction; but liquid or gaseous fuel may be used in the furnace by providing it with suitable burners therefor.

Within the furnace are arranged coils of pipe *b c* on opposite sides thereof with their lower ends connected to the water-leg of the boiler, as shown at *d* and *e*, and the upper ends of said coils connect with another coil *f*, one end *g* of which connects with the water-leg, and the opposite end *h* projects into the steam-space E of the boiler A. The number of coils in the furnace may be varied to suit the conditions of use to which the boiler may be applied. Thus, where a large quantity of steam is required, the coils shown may be multiplied and placed in such position as to most effectively utilize space.

F indicates a coil in the combustion-chamber C, and one end *i* thereof projects down in the furnace B and communicates with the water-leg at *k*, and the opposite end *l* of the coil projects into the steam-space E.

The products of combustion in their passage from the furnace B through the combustion-chamber C to the uptake D completely envelop the coil F and at the same time impart their heat to the water in the boiler A at *m*, *n*, and *o* throughout the length thereof from the furnace to the end of the uptake.

The boiler is divided horizontally by the plate *p*, and the outer end of the steam-space is closed by the plate *q*, and the usual appurtenances—such as gages, &c., (not shown)—are provided. By the construction shown the several coils are filled with water from the boiler, and each and all of the coils are enveloped by the products of combustion in the furnace and in the combustion-chamber, and the steam generated in the coils is discharged into the steam-space of the boiler, from which it is drawn in the usual manner.

Having thus fully described our invention, what we claim is—

1. In a steam-generator, a series of conical coils arranged transversely across a furnace and connected at one end with the water-space of the boiler and a horizontal coil in the combustion-chamber between the furnace and the uptake and connected with the water-space of the boiler and all of said coils connected with the steam-space, substantially as described.

2. In a steam-generator, a series of conical coils arranged transversely across a furnace, a horizontal coil having parallel sides in the combustion-chamber between the furnace and the uptake and connected to the water and steam space of the boiler, and a water-space surrounding the furnace and the combustion-chamber, substantially as described.

3. In a steam-generator, a series of trans-

verse conical coils in a furnace connected to the water-leg on opposite sides of the boiler, a vertical conical coil above said transverse coils connected separately to the water-space of the boiler, the transverse coils connected to the vertical coil, and the vertical coil connected with the steam-space of the boiler, and a horizontal coil in the combustion-chamber between the furnace and the uptake, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH B. BOSSLER.
SAMUEL D. STAUFFER.

Witnesses:
J. A. BAXTRESSER,
JOS. H. NISLEY.