(No Model.)

D. HESS.

STEAM GENERATOR.

No. 256,682. Patented Apr. 18, 1882.

Fig. 1.

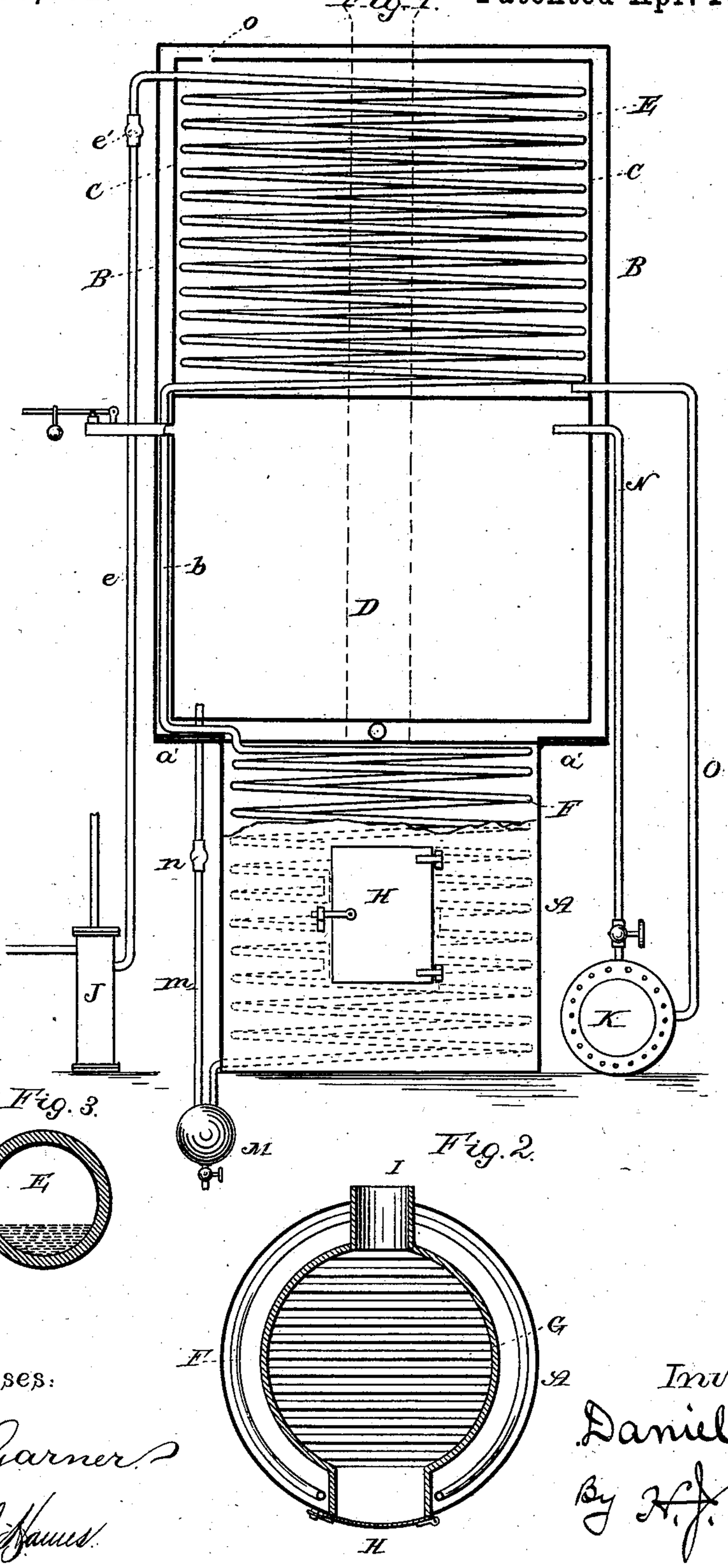

Fig. 3.

Fig. 2.

Witnesses:

J. L. Garner

W. L. D. Hawes

Inventor:

Daniel Hess,

By H. J. Ennis

atty.

UNITED STATES PATENT OFFICE.

DANIEL HESS, OF WINONA, MISSISSIPPI.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 256,682, dated April 18, 1882.

Application filed February 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HESS, a citizen of the United States, residing at Winona, in the county of Montgomery and State of Mississippi, have invented certain new and useful Improvements in Steam-Generators, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a vertical elevation, partly in section, of my improved steam-generator. Fig. 2 is a transverse sectional view through the furnace-door and fire-box; and Fig. 3 is a cross-section of one of the coils E, showing the relative proportions of the water and steam space.

This invention has relation to steam-generators; and the novelty consists in the construction of the same, as will be hereinafter more fully described, and particularly pointed out in the claims.

The object of the invention is to provide a boiler that will be safe in operation, economical of fuel, and portable, as well as cheap and simple in construction.

In the accompanying drawings similar letters of reference indicate like parts of the invention.

A is an outside shell, of cast or wrought iron, and is suitably secured to a bed-plate. (Not shown.) The upper rim of the shell A is provided with a flange, *a*, upon which is secured a sheet-iron shell, B, of a somewhat larger diameter than the lower shell, A. An interior casing, C, of similar material, is placed in the upper part of the larger shell B, and below it is a steam-reservoir, D, made of boiler-iron to stand the usual steam-pressure.

E is a coil of iron pipe located above the reservoir D, and a similar though smaller coil, F, is placed within the lower casing, A. This casing A contains the grate-bars G, furnace-doors H, and smoke-pipe I.

J is an ordinary pump for supplying feed-water, and K represents the steam-engine. The feed-water from the pump J is forced through the pipe *e* and check-valve *e'* into the top layer of the coil E, thence by gravity down through the vertical pipe *b* into the top layer of the smaller coil F, forming the fire-chamber, thence by gravity into the trap M, thence upward through the vertical pipe *m* and check-valve *n* into the steam-reservoir D. The steam is taken through the pipe N from the reservoir to the engine K, and the exhaust-steam from the engine is conducted through the exhaust-pipe O into the heater-coil chamber, which it fills, and escapes through the opening *o* into the jacket-space formed by the outside casing or shell, B, and the inside casing, C, and the reservoir D, and it is allowed to escape finally at the bottom of the jacket into the smoke-stack or into the atmosphere, according to circumstances.

In practice the fire is started and water is pumped into the coil E, where it finds its way into the lower coil, F, where it is converted into steam and passes into the reservoir D, from whence it is supplied to the engine. The exhaust from the engine then heats up the coil, and when it passes around and through the jacket prevents condensation in the coil on the outside, and finally it keeps the reservoir heated before it escapes into the atmosphere.

It will thus be seen that after the engine is started the exhaust-steam heats the coil E to such a degree that the feed-water is almost instantly converted into steam, and in its downward course through the coil forming the fire-box it is then greatly superheated, and in this condition passes into the reservoir D, and is kept in this superheated state by the exhaust-steam, which is constantly passing around said reservoir through the jacket.

Of course it is not necessary that the reservoir be located between the upper and lower coils. It may be placed within the heater-coil E or set to one side; but I prefer to place it as shown, so as to utilize more fully the exhaust-steam and prevent any waste from condensation or radiation.

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

1. In a steam-generator, the coil E, placed within a chamber surrounded by a jacket, said jacket and chamber being-heated by the exhaust-steam, in combination with a superheating-coil located in and forming the fire-box, arranged substantially as and for the purpose set forth.

2. In a steam-generator, the combination of the steam-generating coil E, the superheating-coil F, and the reservoir D, constructed and arranged as and for the purpose set forth.

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

DANIEL HESS.

Witnesses:
E. H. BRADFORD,
H. J. ENNIS.