J. L. KITE.

Steam-Generator.

No. 212,710. Patented Feb. 25, 1879.

FIG 2

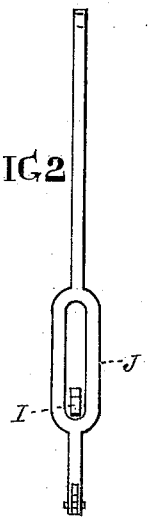
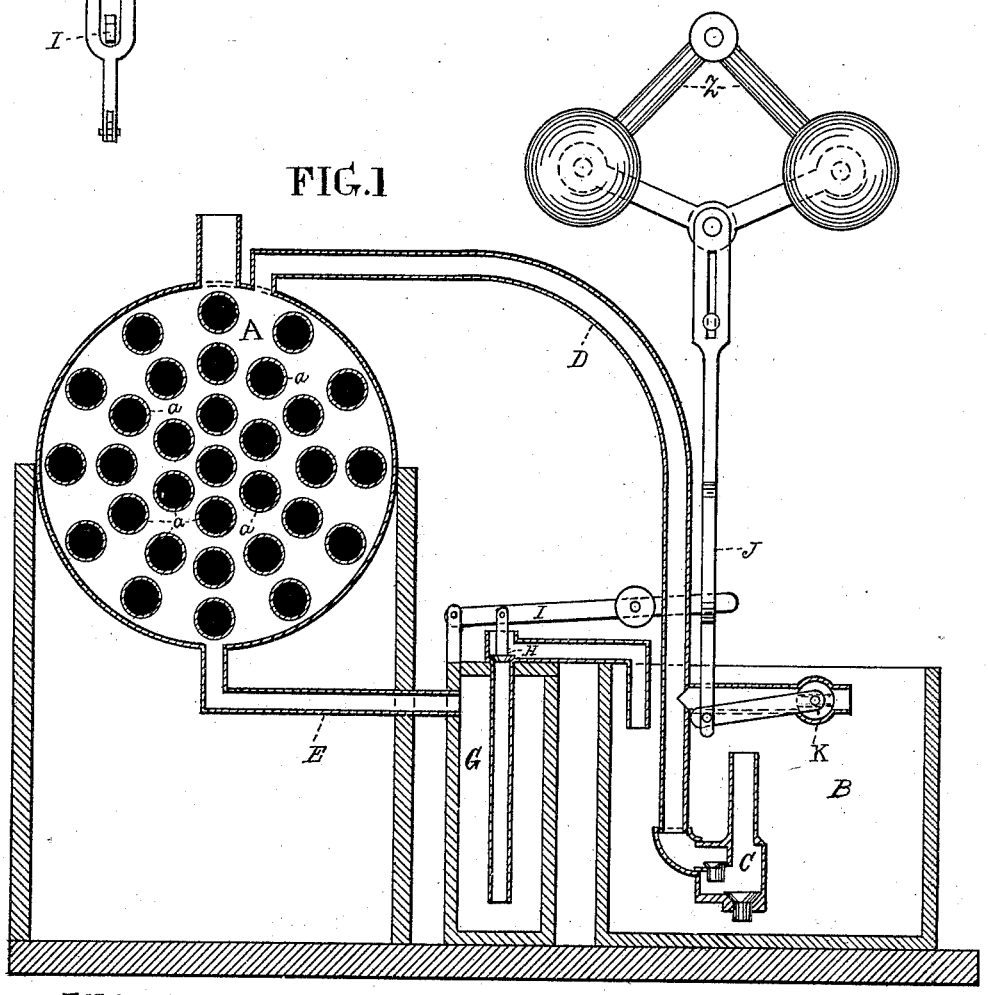


FIG. 1



Witnesses.

Thomas J. Bewley

John Haworth

Inventor

John L. Kite

per Stephen Ustick Attorney

UNITED STATES PATENT OFFICE.

JOHN L. KITE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO PATRICK F. FOY, OF SAME PLACE.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **212,710**, dated February 25, 1879; application filed July 8, 1878.

To all whom it may concern:

Be it known that I, JOHN L. KITE, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Steam-Generators, of which the following is a specification:

The object of my invention is a steam-generator adapted to light work, and which is portable, easily managed, and entirely safe from the possibility of explosion; and the nature of the invention consists of means for regulating the supply of water to the boiler or steam-generator in such quantity as will generate a sufficient amount of steam for the work to be done, and discharge the excess of water and regulate the pressure in the boiler according to the work to be done.

Figure 1 of the drawings represents a vertical section through the boiler A, drainage-chamber G, water-tank B, force-pump C, and connecting-pipes. Fig. 2 is a section, showing the governor-rod with its attachments on an enlarged scale.

Like letters of reference in both figures indicate the same parts.

A is the boiler or steam-generator, which may be made in any desirable form; yet I prefer constructing it, as represented, with horizontal tubes *a*, for the passage of the gas or flames. B is the water-tank, and C a force-pump situated within it, for supplying the boiler with water at its upper side through the pipe D. E is a drainage-pipe, attached to the bottom of the boiler, and communicating with the drainage-chamber G, into which the excess of water from the boiler over that which is generated into steam at each revolution of the engine (not seen in the drawings) is discharged. The chamber is provided with a relief-valve, H, attached to the lever I, which is operated by the yoke J of a steam-engine governor, Z, thus admitting of a free play of the governor-rod unless the speed is greatly in excess.

The operation is as follows: The boiler A being empty, the gas or other fire is started, and a stroke of the pump throws a small quantity of water into the boiler. This water (if there is no excess) is instantly converted into steam of a density determined by the capacity of the boiler, and the engine, starting, delivers a given quantity of water to the boiler at each revolution. If steam is made in excess of the amount required to run the engine at its proper speed, the governor opens the waste-valve K, and allows part of the water to flow into the tank B, and a less quantity is delivered to the boiler and a less amount of steam generated; or no water is thrown into the boiler and no steam generated. If the speed of the engine be much higher than the proper rate, (from the sudden throwing off of its work,) the governor lifts the lever I of the relief-valve by means of the yoke J, and relieves the pressure, and discharges any water that may be in the chamber G and its pipes into the tank B. Any water that may not be converted into steam by the time it reaches the bottom of the boiler runs at once into the chamber G, where it remains until discharged by the governor, or by excess of pressure over the weighting of the relief-valve H, or by lifting the lever for that purpose.

This boiler is therefore absolutely safe, there being no water in the boiler at any time in excess of the amount necessary for one revolution of the engine, and no pressure higher than that reached by the relief-valve can arise. The relief-valve is always cool, and free from danger of sticking from expansion, and the valve-faces are washed by every discharge of water through the chamber G. If the relief-valve should by any means be prevented from rising when its proper limit is reached, the increase in the speed of the engine will cause the governor to assist in lifting it.

I claim as my invention—

1. The combination of the waste-valve K with the boiler and governor, for regulating the supply of water to the boiler, substantially as set forth.

2. The combination of the drainage-pipe E, chamber G, and relief-valve H with the boiler, for draining, collecting, and discharging the excess of water from the boiler, substantially as set forth.

3. The combination of the relief-valve H with the governor, for operating said valve when the pressure is in excess of the amount required for maintaining the proper speed of the engine when not performing its maximum work, substantially as set forth.

JOHN L. KITE.

Witnesses:
STEPHEN USTICK,
WM. LARZELERE.