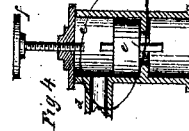
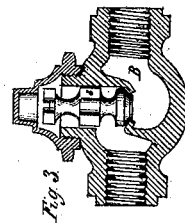
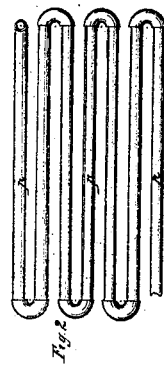
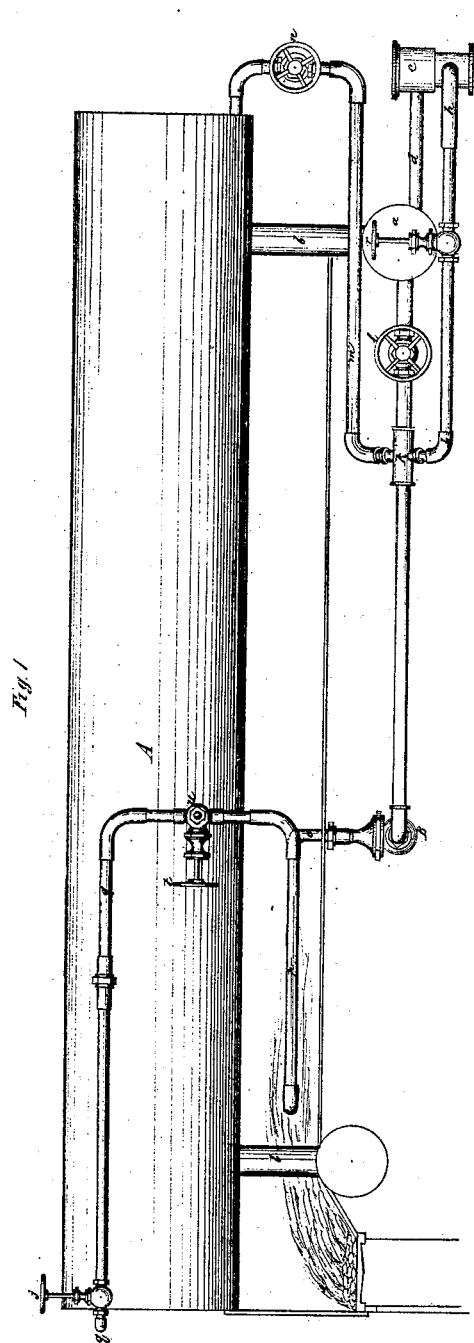


G. W. Shields,
Steam Generator.
No. 110,298.

Patented Dec. 20. 1870.



G. W. Shields, Inventor
Wm. D. D. & Co.
His Attorneys.

Witnesses.
H. J. Smith
Thomas D. D.

United States Patent Office.

GEORGE W. SHIELDS, OF LOUISVILLE, KENTUCKY.

Letters Patent No. 110,298, dated December 20, 1870.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, GEORGE W. SHIELDS, of Louisville, in the county of Jefferson and State of Kentucky, have invented a new and improved Steam-Generator; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a side elevation;

Figure 2, a plan view of the steam-generator;

Figure 3 is a sectional elevation of a valve-chamber, with an elevation of the valve; and

Figure 4 is a sectional elevation of the valve-chamber, through which the feed-water enters the apparatus.

This invention relates to certain improvements of construction and detail in that class of steam-generators in which the feed-water, prior or subsequent to entering the boiler, is conducted through pipes that traverse the furnace-chamber, where, when a fire is built, said pipes and the water therein are heated by caloric that would otherwise be wasted, and a more speedy generation of steam ensues.

Referring to the drawing—

A is a steam-boiler.

a, a mud-drum, placed transversely beneath the boiler.

b, a pipe connecting the boiler and drum.

c, a vertical chamber placed at one side of the drum a, and connected therewith by a pipe, d.

e, a cylindrical valve, placed within the chamber c and controlling the aperture i, through which feed-water, forced into the chamber by a "doctor" or side pump, passes upward, lifting the valve e, and passing through the pipes d and b and drum a into the boiler.

A screw, f, is placed in the top of the chamber c, for the purpose of closing the valve e, when desired.

The occasion for closing the valve arises when, instead of forcing the water into the boiler in the above-described manner, it is preferred to pass it through the pipe h that leads from the chamber c to the main pipe k, located beneath the furnace and connected with the mud-drum at one end, which connection is controlled by a valve whose hand-wheel is lettered l, said pipe k being also connected with the boiler by a branch-pipe, m, supplied with a valve whose hand-wheel is lettered n.

At its other extremity the pipe k opens into the valve-chamber B, located beneath the furnace.

Said valve-chamber is connected by a pipe, o, with a serpentine series of pipes, p, placed within the furnace beneath the boiler, which series is connected by a pipe, q, supplied with a valve whose hand-wheel is lettered j with the boiler, the pipe q entering one end of the latter above the water-line.

To divert the feed-water from the mud-drum a, close the valve e, within the chamber c, by turning down the screw f.

The feed-water then has no way of escape from the chamber c except through the pipe h, the valve of which should be opened by turning the hand-wheel r, thus allowing the water to flow into the pipe k.

The hand-wheel l should be turned so as to close its valve and shut the water off from the drum a.

The hand-wheel n should also be turned so as to close the pipe m.

This directs the water into the chamber B, the valve s in which it lifts, and flows thence into the serpentine series of pipes p, where it is heated by the otherwise waste caloric.

From the pipes p the water, or, if vaporized, steam, flows to the boiler through the pipe q.

When the water is conducted to the boiler by way of the mud-drum, as first described, the hand-wheels r and l must be turned, so as to close their pipes.

In this case the water, after entering the boiler, flows out through the pipe m, whose valve must be open, into the serpentine series p, where it is vaporised, and whence it passes back into the boiler in the form of steam.

When the pipes p need blowing out the hand-wheel j is turned to close the pipe q, and the hand-wheel t is turned so as to open the chamber u in the side of the pipe q; the steam being turned back blows out the pipes.

By means of the valve-wheel t the amount and condition of the water in the pipes p can at all times be ascertained.

Having thus described my invention,

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

The arrangement of the chamber c, pipes h, k, o, p, and q, boiler A, and pipe m, as specified.

Witnesses: GEORGE W. SHIELDS.

E. CLARK,
E. JEWELL.