

G. W. Shields,
Steam Generator.
No. 110,298. *Patented Dec. 20, 1870.*

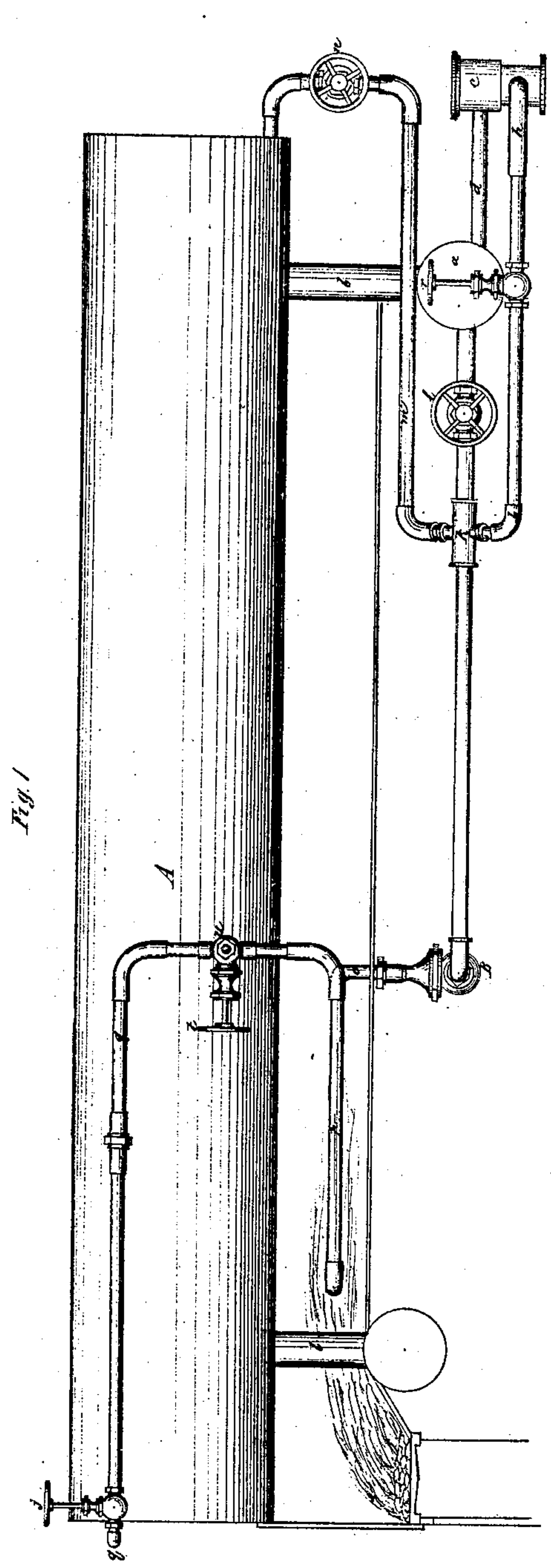


Fig. 1

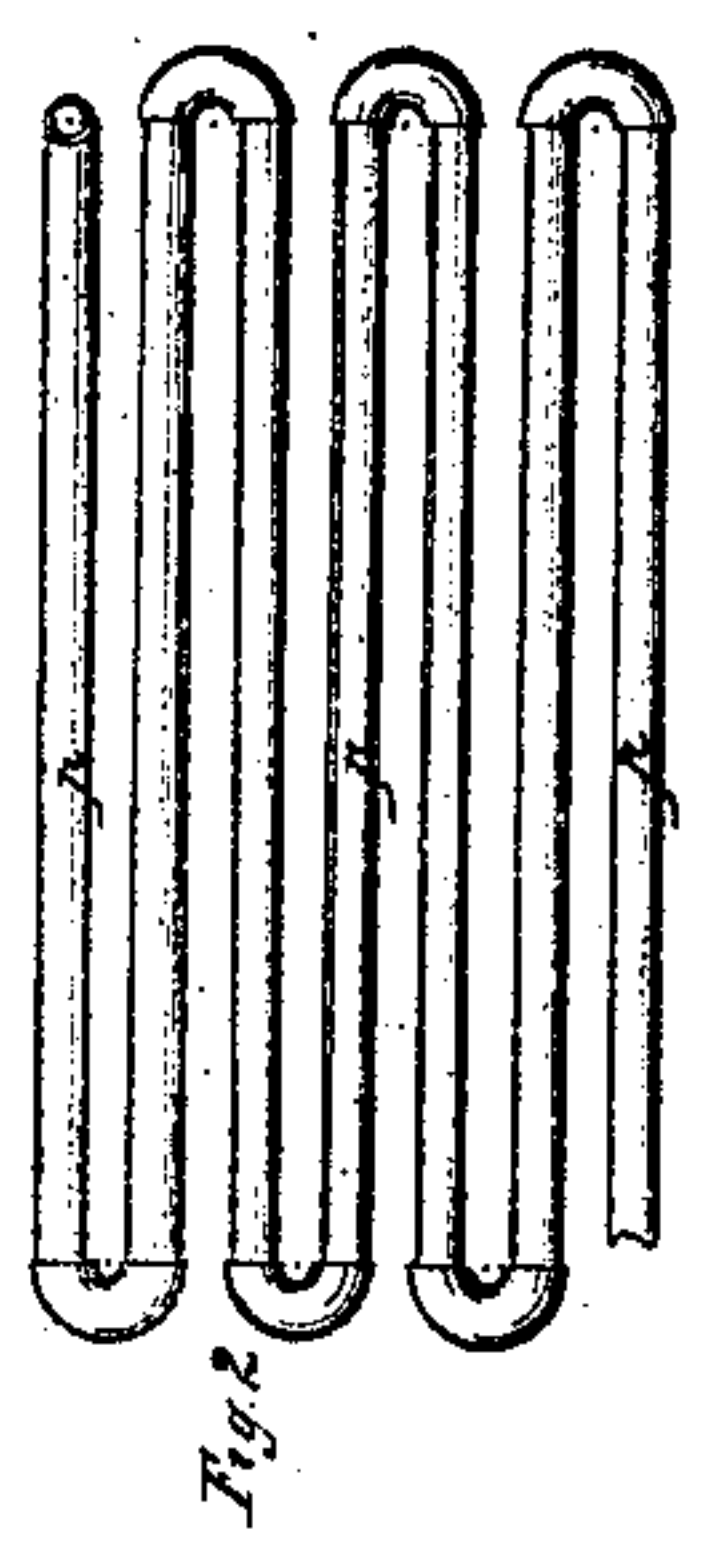


Fig. 2

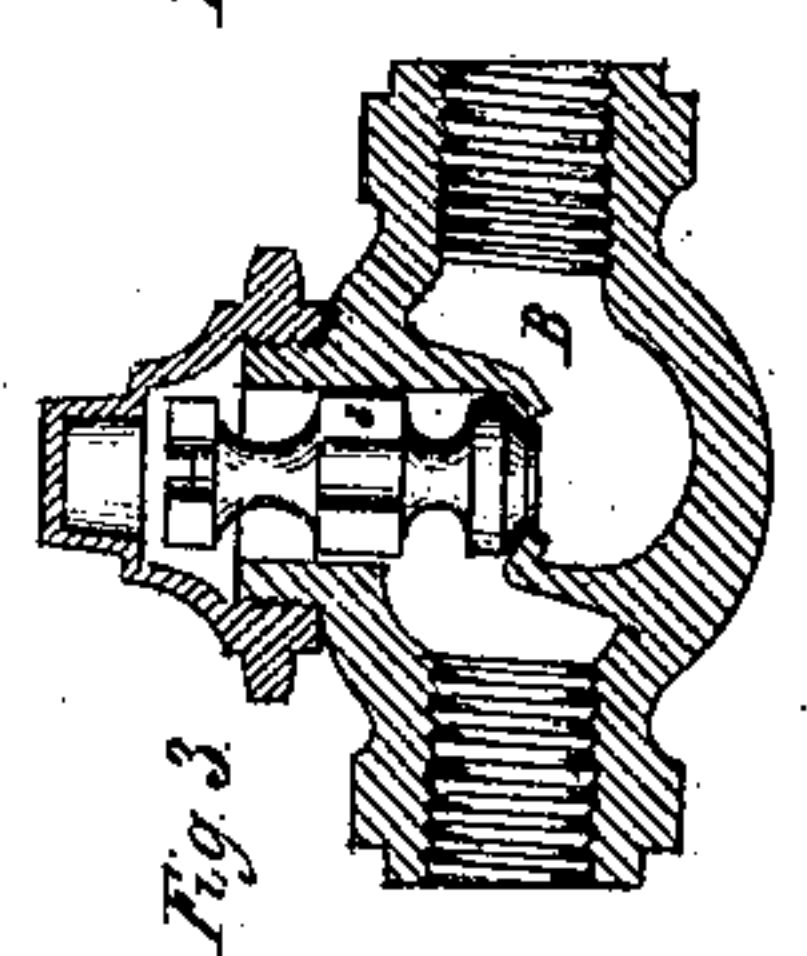


Fig. 3

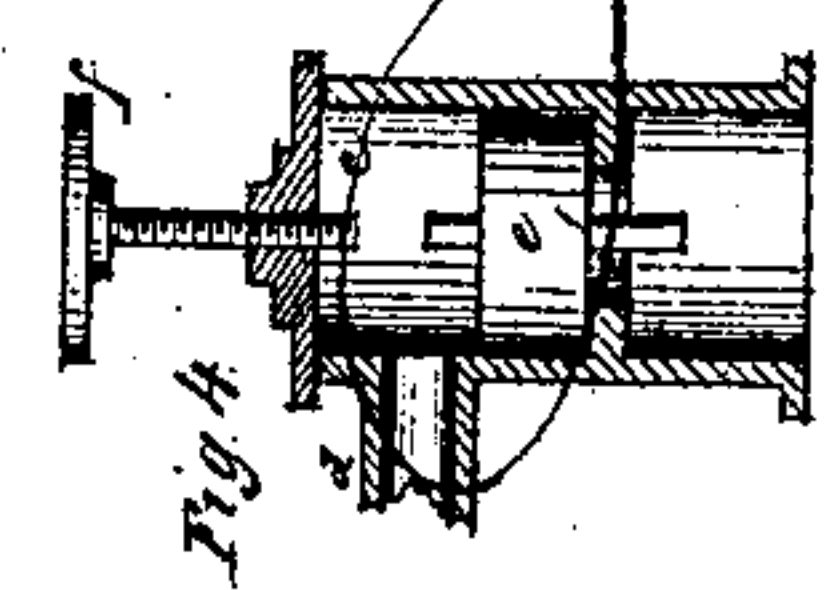


Fig. 4

G. W. Shields, Inventor.
Wm. H. & C.
His Attorneys.

Witnesses.
W. J. Arns
Thos. 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.