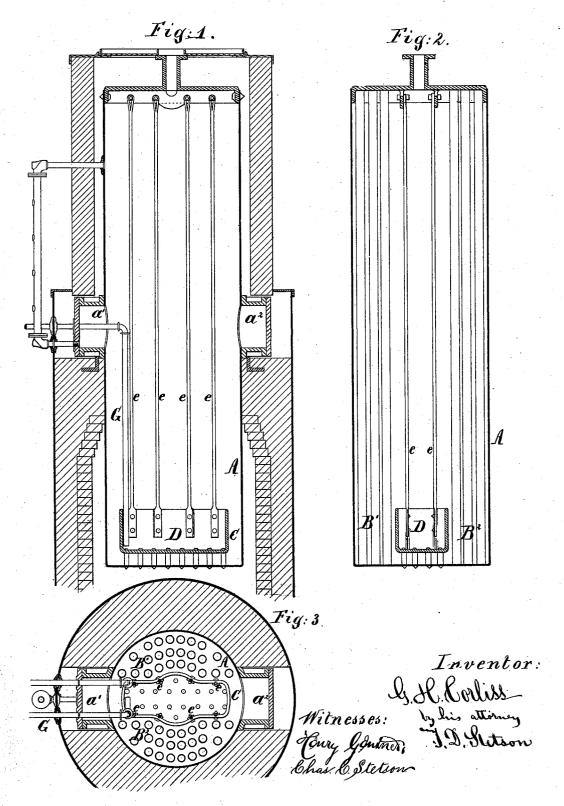
## G. H. CORLISS. STEAM-BOILER.

No. 177,692.

Patented May 23, 1876.



## UNITED STATES PATENT OFFICE.

GEORGE H. CORLISS, OF PROVIDENCE, RHODE ISLAND.

## IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 177,692, dated May 23, 1876; application filed October 15, 1875.

To all whom it may concern:

Be it known that I, GEORGE H. CORLISS, of Providence, in the State of Rhode Island, have invented certain Improvements relating to Steam-Boilers, of which the following is a

specification:

I have devised a form of boiler, and an arrangement of the several parts thereof, which, while well adapted for generating steam and for resisting the pressure thereof, and forming in all respects a well constructed boiler, combines unusual facilities for cleaning and repairs with a free water circulation. In cases where water is used containing a large amount of sediment it provides for collecting the same, and so presenting it to the blow-off pipe that portions of it will be removed at each operation of blowing off. Provision is also made by two opposite man-holes and covers for inserting the blow-off pipe and other pipes through a removable cover, while the cover opposite is left clear of any pipes or incumbrances, so that it may be easily removed to allow the entrance of the operator to reach every portion of the interior for examination or repairs. The general style of boiler is upright tubular. The tubes, instead of being evenly distributed, are aggregated into two clusters, one on each side of the central line, with a space between them of sufficient width for a person to work therein. Near the bottom of this space is a large open-top vessel, intended to collect sediment. The current of water, as it descends, precipitates its sediment directly into the tub, while the cleaner water moves out sidewise, and, descending to the bottom, becomes further heated by the tubes and crown-sheet, and again rises to repeat its circuitous travel.

The accompanying drawings form part of

this specification.

Figure 1 is a vertical section of the boiler and setting, in the plane of the man-holes. Fig. 2 is a corresponding section of the boiler at right angles thereto. Fig. 3 is a horizontal section through the boiler.

Referring to the drawing, A is the shell of the boiler, constructed and applied together and equipped, except as hereafter described, in any ordinary or suitable manner. I form two man-holes,  $a^1 a^2$ , equipped with their respective strong covers. One of the plates or

covers,  $a^1$ , is to be rarely removed. It forms a means through which a blow-off pipe, feedpipe, and sundry other pipes may be connected. The other man-hole cover,  $a^2$ , has no pipes, and is ready to be removed and replaced as often as desired. The tubes are arranged in sets, B1 B2, leaving a space, C, between them. Near the bottom of the space C is a cast-iron tub, D, of the form represented, and adapted to receive mud. Stays e are firmly riveted or otherwise secured to the inner face of the tub. and extend up to crows' feet or other suitable fastenings in the top plate of the boiler. I prefer, as shown, to make the top plate of castiron, with deep webs, and to secure the stays or braces e to those webs. Below the tub the bottom plate of the boiler is stayed at a proper distance from the tub by means of thimbles and rivets, or by means of threaded stays similar to those used in setting the fire-boxes in locomotives. G is a blow-off pipe, controlled by a suitable cock. It enters through the plate  $a^1$  and bends downward, terminating within and near the bottom of the mud-tub D.

After the boiler has been used a while the stop-cock on the blow-off pipe is opened and a quantity of the water is blown out. The water thus taken comes from the inside of the tub D, near the bottom. If mud is accumulated in the tub some mud is thus blown out, and after the clear water comes a further quantity of mud is likely to be stirred up and blown out by the motion of the water. Frequent repetitions of the blowing off tend to remove all the mud in the tub D.

Whenever it is desired to examine and repair the boiler, or to more thoroughly clean out the mud tub D, the bolts (not represented) which secure the cover  $a^2$  are removed, and free access is thereby attained for the operator to enter the boiler and place his feet in the tub D. He can then examine the tubes, the stays, &c., and make any repairs or alterations of these parts, or of the blow-off pipe or other parts.

My boiler may be as efficiently stayed longitudinally as any other. The tubes brace the portions where they are placed, and the rivets and thimbles below the tub D, and the stays e above the tub, as shown, give a very efficient support to both entire ends of the boiler.

I claim as my invention—

1. The two series of tubes  $B^1$   $B^2$ , with the open space C between them, in combination with the man-holes  $a^1$   $a^2$ , as and for the purpose specified.

2. The mud-tub D, arranged in the open space C between the sets of tubes, as herein

specified

3. The rigid mud-tub D, in combination with a series of stays connecting therefrom to the bottom of the boiler, and with a series of stays extending from the sides of the tub to a point in the top plate of the boiler, substantially as and for the purposes herein specified.

4. The blow-off pipe G, in combination with the boiler A, man-hole cover  $a^1$ , and mud-tub D, as herein specified.

In testimony whereof I have hereunto set my hand this 6th day of October, 1875, in the presence of two subscribing witnesses.

GEO. H. CORLISS.

Witnesses:

GEORGE G. PHILLIPS, ED. W. RAYNSFORD.