

(No Model.)

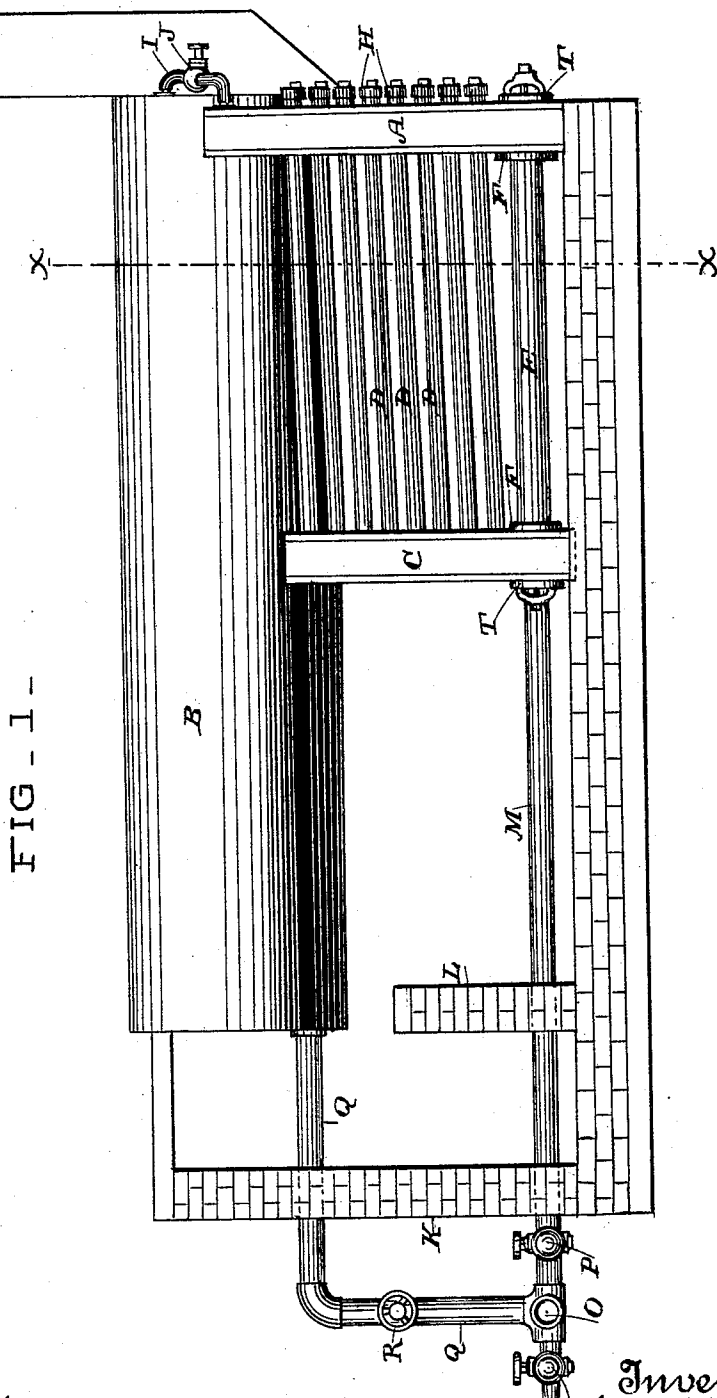
3 Sheets—Sheet 1.

J. T. CHAREST.

WATER FRONT AND FIRE BOX FOR BOILERS.

No. 475,035.

Patented May 17, 1892.



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J. A. Bayless

Inventor,
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By *Dewey Ho*
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(No Model.)

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FIG - 3 -

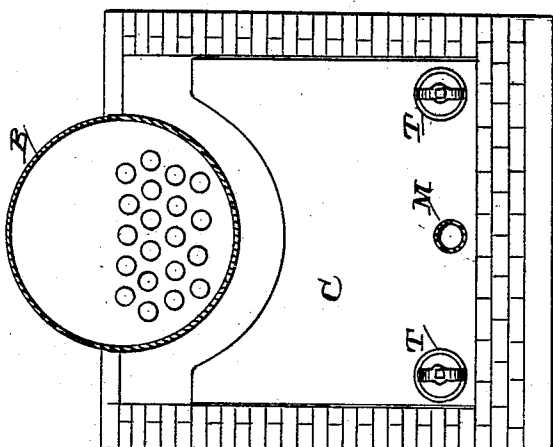


FIG - 2 -

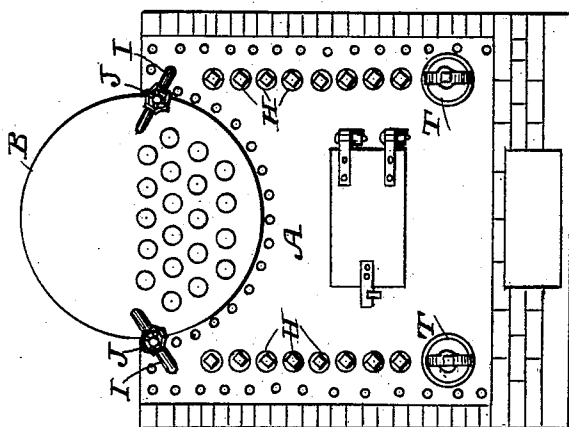
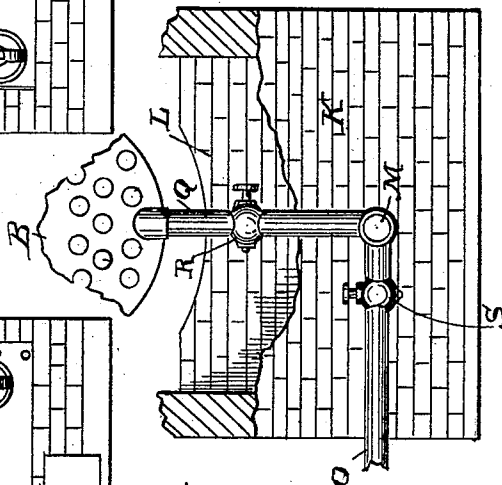


FIG - 4



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(No Model.)

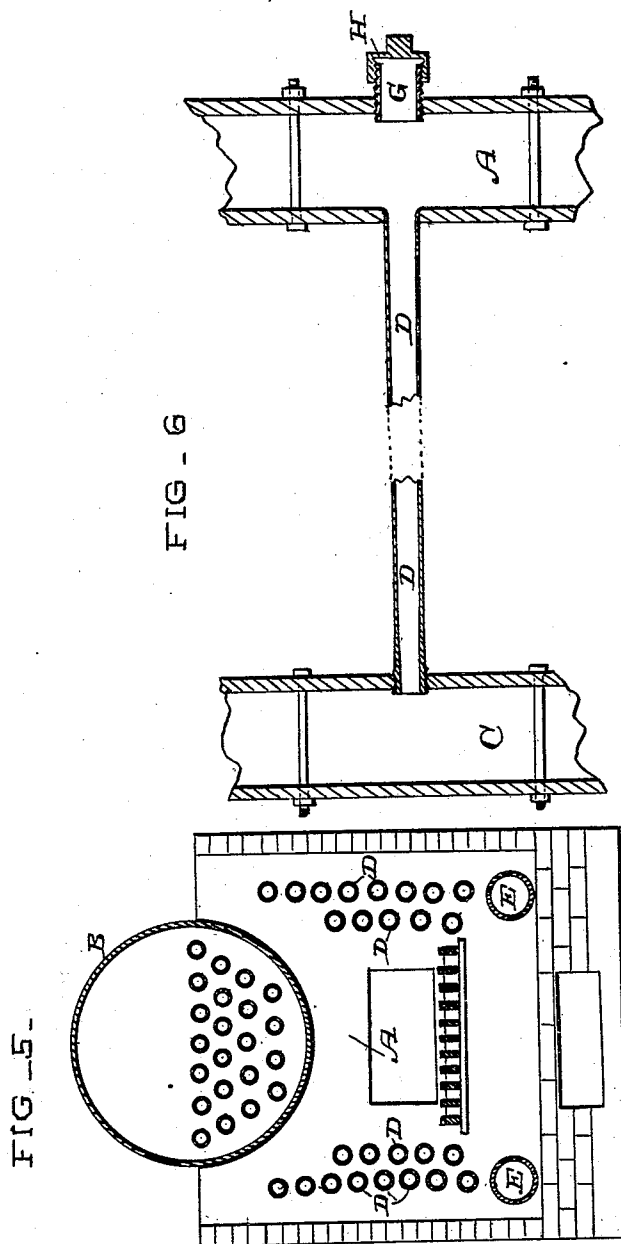
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UNITED STATES PATENT OFFICE.

JOHN T. CHAREST, OF RED BLUFF, CALIFORNIA.

WATER-FRONT AND FIRE-BOX FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 475,035, dated May 17, 1892.

Application filed June 24, 1891. Serial No. 397,385. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. CHAREST, a citizen of the United States, residing at Red Bluff, Tehama county, State of California, have invented an Improvement in Water-Fronts and Fire-Boxes for Boilers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a water-front and fire-box attachment for boilers; and it consists in certain details of construction in connection with these parts, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation with the side wall removed to show the interior construction. Fig. 2 is a front of the boiler. Fig. 3 is a rear view of the bridge-wall C. Fig. 4 is a view of the rear walls and boiler, showing the pipe connection. Fig. 5 is a transverse section taken across the furnace in line *x x*, Fig. 1. Fig. 6 is a section of the front wall and rear bridge-wall, showing the manner of securing the pipes in place.

A is the front of a boiler-furnace, which is made with the upper part fitted to receive and support one or more boilers B. This front is made with the front and rear walls separated from each other, so as to leave a water-space of any suitable dimensions between them, and the walls are held together by any suitable number of stay-bolts which will retain them in the proper position. The usual fire and ash door openings are made through the front, connecting with the interior of the furnace.

At the rear of the furnace is the hollow bridge-wall C, which is made similar in every respect to the front A; but the concavity or space in the top is sufficiently below the bottom of the boiler to allow the flames and products of combustion from the furnace to pass over this wall and into the combustion-chamber in the rear, which will be hereinafter more fully described. This bridge-wall is also somewhat narrower than the front A, in order to allow the structure to be introduced or removed after the permanent surrounding brick walls of the boiler-setting have been built.

Between the front A and the bridge-wall C extend the pipes D. These pipes are arranged

in single or double series upon each side of the furnace and interior to the side walls of the boiler-setting. They may be about two and one-half inches in diameter, and if set in single vertical rows are sufficiently close together to allow the flames and heat to circulate around them inside of the brick setting. If made in double rows, as shown in Fig. 5, the inner and outer tubes upon each side will alternate, so as not to occupy the same horizontal planes, thus allowing the heat to circulate more freely among them. At the bottom upon each side the large tubes E, which may be about six inches in diameter, connect the front wall A and the bridge-wall C, these tubes having screw-threads cut upon them and screwing through the washers or collars F, which are correspondingly threaded and fit against the inner walls of the front and bridge-wall, respectively. These tubes screw through the collars and into the inner walls of the front and bridge-wall, respectively, thus forming a large open communication at the bottom and below the level of the fire-grate, so that any sediment which is deposited from the water will gradually accumulate in these large tubes, which serve as mud-drums.

The rear ends of the tubes D, which are of the usual thin boiler-tube material, have welded onto them thicker tubes of iron, which allows screw-threads to be cut upon it without dangerously weakening the tube and so that the rear ends of these tubes may screw into the front plate of the bridge-wall to form connection therewith. The front ends of these tubes are expanded and fitted into the rear wall of the front A in the usual manner for securing boiler-tubes. In order to do this work, the front wall of the front A has holes made in it in line with each of the tubes D and E, these holes being of larger diameter than these tubes. Screw-threads are cut in the holes, and in these holes are fitted thimbles G, which screw into them, as shown. These thimbles have an interior diameter sufficient to allow the tubes D to be introduced or removed through them, and as the thimbles remain in place during this operation the screw-threads in the boiler front are protected and prevented from being abraded or worn when this operation takes place. The outer ends of these thimbles are closed by

brass caps H, threaded upon the inside to fit upon the corresponding exterior threads of the thimbles. By removing these caps at any time access to the tubes may be had and any one or more of them removed or replaced when necessary.

From the upper part of the boiler front, upon each side, pipes I connect with the front head of the boiler, opening through it, and thus allowing a free circulation of water between the boiler front and the boiler itself. These pipes may be provided with cocks or valves J, by which communication between the boiler and the front may be cut off at pleasure, as for the purpose of repairs or for other reasons.

In the present case I have represented the boiler as about fourteen feet in length, of the tubular pattern, having an uptake and smoke-stack at the front, through which the products of combustion return from the rear end. The furnace may approximate about six feet in length, and in the space between the bridge-wall C and the rear brick wall K of the furnace I build an intermediate wall L. This wall extends across between the side walls of the boiler-setting, about two feet from the rear wall, and has a sufficient space between its upper surface and the bottom of the boiler to allow the products of combustion to pass freely into the space behind it, which is termed the "back connection." This provides a supplemental chamber between the bridge-wall C and the wall L, in which the hot gases and products of combustion are checked, and an eddy is formed, which greatly assists in heating this portion of the boiler and in preventing a too-rapid passage of the hot gases. From the back connection these gases return through the boiler-flues and produce additional heat therein, eventually passing out through the uptake and smoke-stack.

M is a pipe connecting with the bottom of the hollow bridge-wall C, extending out through the walls L and K, as shown in the present case, and connecting directly in line with the blow-off cock N.

O is the feed-water pipe, which in the present case connects with the pipe M, opening into one side of it.

P is a cock by which connection between the feed-water pipe and the pipe M may be cut off or opened at pleasure.

Q is a pipe connecting with the rear of the boiler near the bottom and uniting with the pipe M, and R is a cock situated at some point between the pipe M and the boiler, by which communication may be cut off. I have here shown these pipes for convenience extending through the rear wall of the boiler-setting; but it will be manifest that they may be connected with the bottom of the bridge-wall, so as to open out through one of the side walls of the boiler-setting, if convenient or preferable. As here shown, the same pipe M serves to receive the feed-water under ordinary conditions and deliver it into the lower part of

the bridge-wall, from which it is distributed through all the connecting-pipes of the sides and to the hollow boiler front and thence to the boiler.

When for any reason it is desired to provide direct circulation between the rear end of the boiler and the bottom of the bridge-wall, and cocks R and P being opened, the cock N of course being closed, the circulation will take place freely and continuously.

When it is desired to clean out the pipes, boiler front, and bridge-wall, the cocks J and R, connecting with the boiler, may be closed, and the cock S, connecting with the feed-water inlet, being also closed, the cocks P and N are opened and the steam-pressure within will blow out all the sediment which may have collected in the bottom of the walls A and C and in the pipes E. The boiler itself may be blown off in a similar manner by opening the cock R, which communicates directly with the blow-off N. Thus the whole apparatus may be effectually cleaned out whenever desirable.

Hand-hold plates T are fitted to the boiler front and the bridge-wall C in line with the pipes E, so that access may be had to them at any time.

By this construction it will be seen that this boiler front and furnace may be applied to any boiler which is already set up, as the bridge-wall can be introduced between the side walls and beneath the boiler, and the boiler front, taking the place of the ordinary front, will abut against the front ends of the side walls or be set into them, after which the tubes D and E, connecting these, may be introduced and secured in place and the grate-bars placed and supported in the usual manner.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A boiler-furnace having the surrounding walls, the independent hollow front having front and rear walls separated from each other to form a water-space, a hollow bridge-wall having separated front and rear walls, the pipes D, connecting the hollow front and bridge-wall, and the lower tubes E, having a larger diameter than the tubes D and having their ends threaded and fitted to collars on the inner walls of the hollow front and bridge-wall, said tubes E being below the level of the grates, substantially as herein described.

2. A boiler-furnace having the surrounding walls and the independent hollow front and hollow bridge-wall, with the side connecting pipes, as shown, in combination with the feed-pipe and hollow blow-off cock connecting with the bottom of the bridge-wall and the supplemental pipe Q, connecting said pipes with the rear of the boiler and having the cocks, substantially as herein described.

3. A boiler-furnace having the surrounding walls, independent hollow iron front and hollow bridge-wall, with the side connecting-tubes within the outer side walls of the fur-

nace, said tubes having the rear ends thick-
ened and screw-threaded so as to screw into
the front wall of the hollow bridge-wall, the
front ends of the tubes being expanded within
5 the rear wall of the hollow front, holes made
in the front wall of the front in line with said
tubes, having thimbles of larger diameter than
the tubes screw-threaded and fitting into
said holes, whereby the tubes may be removed
10 through the thimbles and the screw-threads

protected from injury, and exterior caps fit-
ting over the thimbles and closing the ends
thereof, substantially as herein described.

In witness whereof I have hereunto set my
hand.

JOHN T. CHAREST.

Witnesses:

S. H. NOURSE,

J. A. BAYLESS.