(No Model.) 2 Sheets—Sheet 1.

A. P. CREQUE.

CERAMIC BOILER.

No. 491,083. Patented Feb. 7, 1893.

Fig: 1.

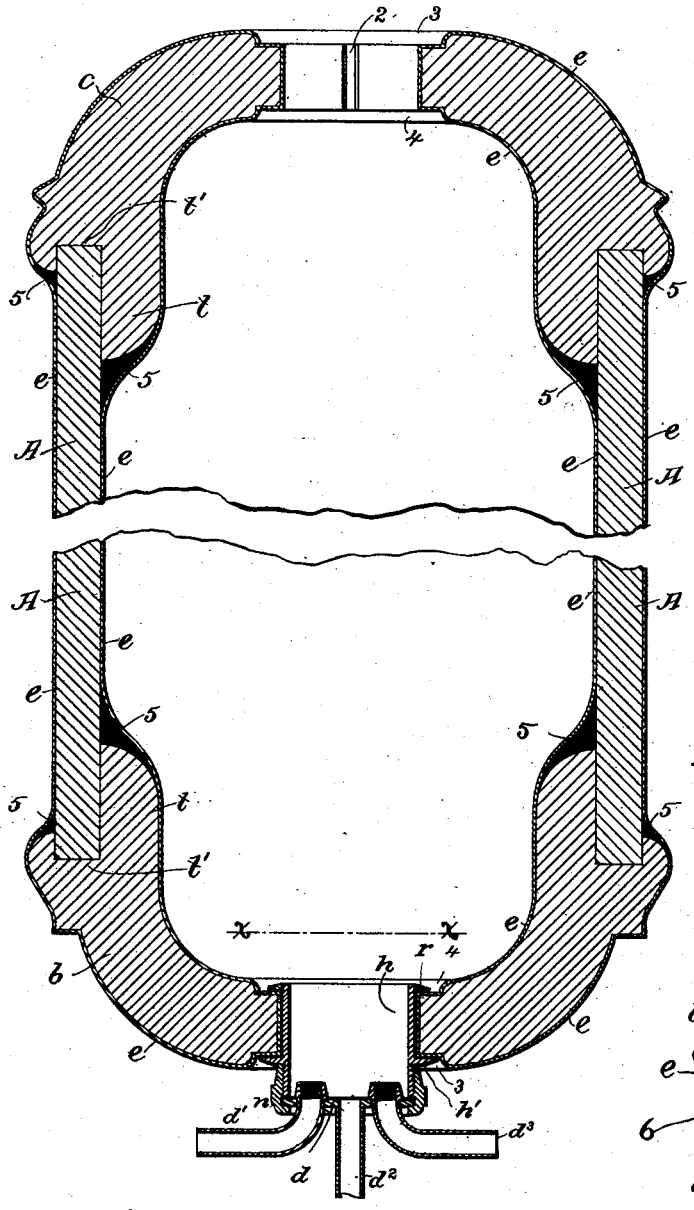


Fig: 4.

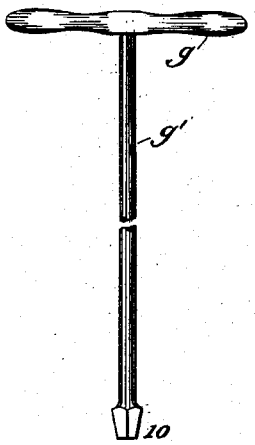


Fig: 3.

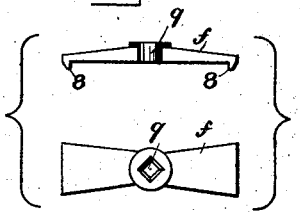
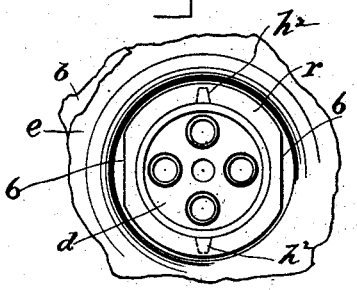


Fig: 2.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

A. P. CREQUE.

CERAMIC BOILER.

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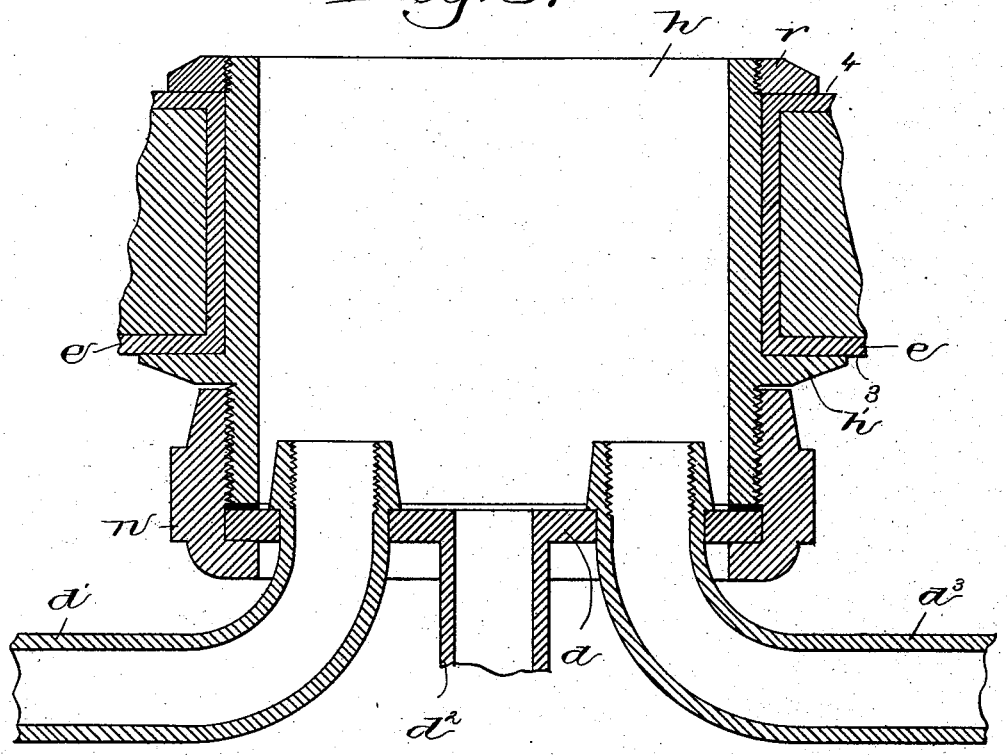
Fig. 5.



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UNITED STATES PATENT OFFICE.

ALLEN P. CREQUE, OF NEW YORK, N. Y.

CERAMIC BOILER.

SPECIFICATION forming part of Letters Patent No. 491,083, dated February 7, 1893.

Application filed January 5, 1885. Serial No. 152,083. (No model.)

To all whom it may concern:

Be it known that I, ALLEN P. CREQUE, of New York, county and State of New York, have invented an Improvement in Ceramic Boilers, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve the construction of ceramic boilers whereby the same are made strong and durable, the boilers being preferably glazed or enameled externally and internally.

Figure 1, in vertical section represents a ceramic boiler embodying my invention, the body being broken out to save space on the drawings. Fig. 2, a view of the lower portion of the boiler and some of its connected parts below the dotted line *x*—*x*. Fig. 3 an edge view and plan of the spanner. Fig. 4 is a side elevation of the key to engage and turn the spanner, the shank of the key being broken out to save space on the drawing. and Fig. 5 a detail on an enlarged scale to be referred to.

In the manufacture of my improved boiler, a compound of clay, substantially such as employed in the manufacture of drain or sewer pipe, is forced under great pressure through a die as in the manufacture of sewer pipe, to thus form a tubular portion suitable for the body A of the boiler, and such body is set aside to partially dry. Molds preferably of plaster of paris are made having concavities shaped to correspond in outline with the shape desired for the ends *b*, *c* or the bottom and head of the boiler. These molds have clay substantially such as described packed into them by hand for a thickness equal to that desired for the bottom, or for the head. At the proper time, during the process of packing the clay into the mold, the clay has inserted into it one end of a wooden or other cylinder which acts as a pattern about which the clay is tamped or packed so that when the said cylinder is removed an annular recess and shoulder will be left in the said end, see Fig. 1 for the reception of the ends of the body A previously formed. The head *c*, and the bottom *b*, at their centers, are provided each with a circular hand-hole the inner walls of which at two opposite sides are provided with grooves or slots 2, one of which is shown in Fig. 1 in full lines, and both in dotted lines Fig. 2. The inner surfaces of both the head and bottom will preferably have recesses 4, and their outer sides recesses 3 to receive rings and flanges as will be described.

The body, and the head and bottom having been made and partially dried are assembled together, the ends of the body being inserted in the annular grooves of both the bottom and head, water and some clay being used between the contiguous surfaces to form the connection, and so assembled a clay compound known as Albany slip-clay is added as at 5, and the parts are set aside to dry. Having been sufficiently dried, the assembled parts are put into an oven and baked to the consistency of what is known as "biscuit." This done the "biscuit" is provided with a coating of glazing or enameling material, and the biscuit so treated is placed in a furnace to bake, the enameling coating at such time incorporating itself with the "biscuit" and forming an enamel such as found upon the surface or face of what is known as porcelain enamel or fancy bricks.

The porcelain enamel as shown at *e* will cover the entire inner and preferably the entire outer surface of the boiler, and the boiler so made is capable of withstanding heat and cold without breaking.

The hand-holes in the head and bottom have to be provided with metallic fittings for the various pipes used in the introduction and circulation of both cold and hot water. In the drawings I have shown only one hand hole as provided with such fittings. The first part of the fitting to be applied is the threaded metal ring *r* cut or slabbed away at two points as shown at 6, 6, Fig. 2, to thus lessen its diameter in one direction sufficiently to enable the said ring to be inserted edgewise into the boiler through the hand-hole, the straight edges 6, 6, at such time passing through the grooves 2 one of which is shown in Fig. 1, and both by dotted lines Fig. 2, and thereafter the said ring is tipped over into the seat 4 and turned one fourth around as in Fig. 2, the wider part of the flange of the ring in such position covering the said grooves. Next I introduce the spanner *f* through the hand hole and place its prongs 8, 8, so as to engage

the edges 6, 6, of the ring r, and then the key composed of the handle g and shank g' is inserted into the boiler through the opposite hand-hole and its squared head 10 is inserted in the socket 9. In this condition the sleeve or ring h, provided with two longitudinal ribs h^2 and screw threaded at its upper and lower ends and having an annular flange h' is inserted through the hand-hole with the ribs h^2 in the grooves 2, and the inner end of the sleeve is placed in engagement with the thread of the ring r and then the key is turned to screw the ring down upon the sleeve and draw its flange h' up against the bottom of the boiler into the recess 3 as in Fig. 1. The ring and sleeve constitute a bushing for the hand-hole and against the lower end of the sleeve is clamped or otherwise secured a multi-passage cover d substantially as described and claimed in my application Serial No. 151,762 (see Patent No. 407,819 dated July 30, 1889,) and therefore not herein claimed, the said plate having tubular projections d', d^2, d^3 &c with which may be connected in any usual manner the pipes to be employed with the boiler.

The body and ends are made of sufficient thickness to withstand very considerable strain. The multi-passage cover is herein shown as held in place by a flanged screw-nut or ring n.

In this my invention it will be noticed that the head and bottom or ends are thicker than the sides to thereby add to the strength of the boiler. In case the pressure is to be considerable I may provide the assembled body and ends at the interior of the boiler with a thin coating of slip-clay thereby rendering the boiler more impervious to water. To tighten the joint between the bushing and the end of the boiler about the hand-hole I may employ any usual or suitable gaskets or packing or cement as indicated by the heavy line between the bushing and the edges of the hand-hole.

Both ends of the boiler have annular extensions t to enter the cylindrical body portion A and have shoulders t' to meet the ends of the said body portion thus making a long surface for contact and materially strengthening the junction of the ends with the said body portion.

I claim—

1. A boiler comprising a cylindrical body, a head and a bottom, each made of ceramic ware, the square ends of the body being fitted to grooves in the head and bottom, and united by plastic clay, and the whole enameled and baked, substantially as described.

2. A boiler provided at its end with a hand-hole, and grooved at 2, and a ring cut away at its sides to enter the boiler through the said grooves, combined with a threaded sleeve h having flange h', substantially as described.

3. A boiler provided at its end with a hand-hole, a ring r reduced in diameter to permit it to be inserted into the said boiler through the said hand-hole, combined with a screw threaded sleeve provided with a flange, a multi-passage cover d, and with a threaded nut or ring n to engage the said sleeve and clamp the cover d thereto, substantially as described.

4. A boiler of ceramic ware comprising a cylindrical body, a head and a bottom, the said head and bottom being made with annular grooves to receive opposite ends of the body, and also having the annular interior extensions t, and the shoulders t', the said body and head and bottom being united by plastic clay, and enameled and baked, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALLEN P. CREQUE.

Witnesses:
G. W. GREGORY,
JOS. P. LIVERMORE.