

W. BLOXHAM.
WATER TUBE BOILER.

No. 548,624.

Patented Oct. 29, 1895.

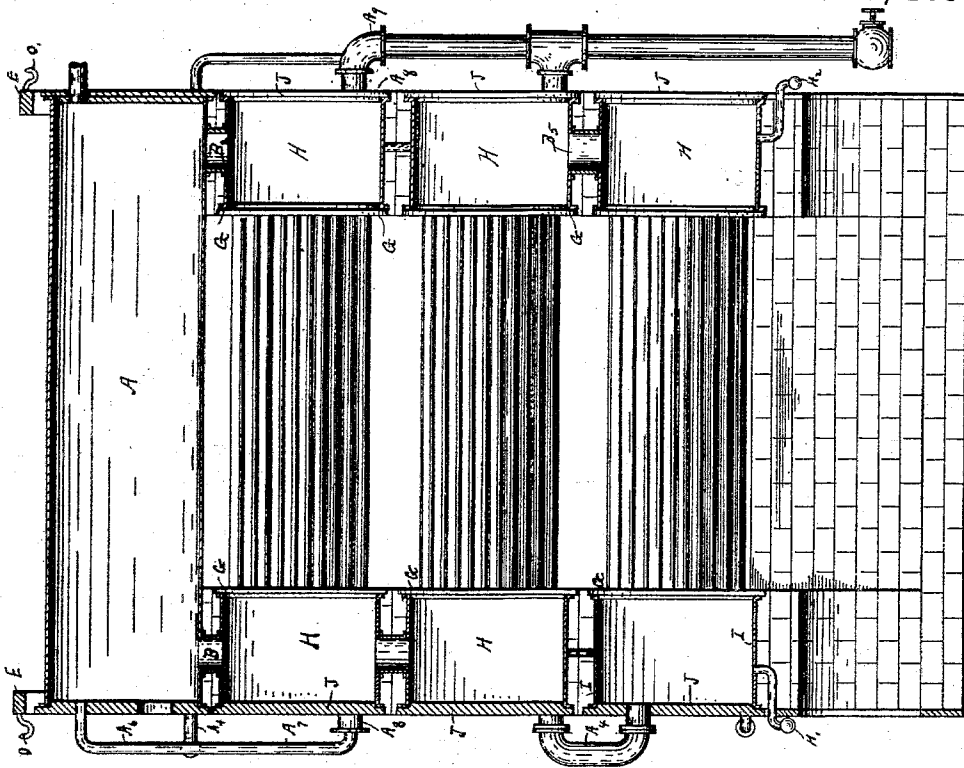


Fig. 2.

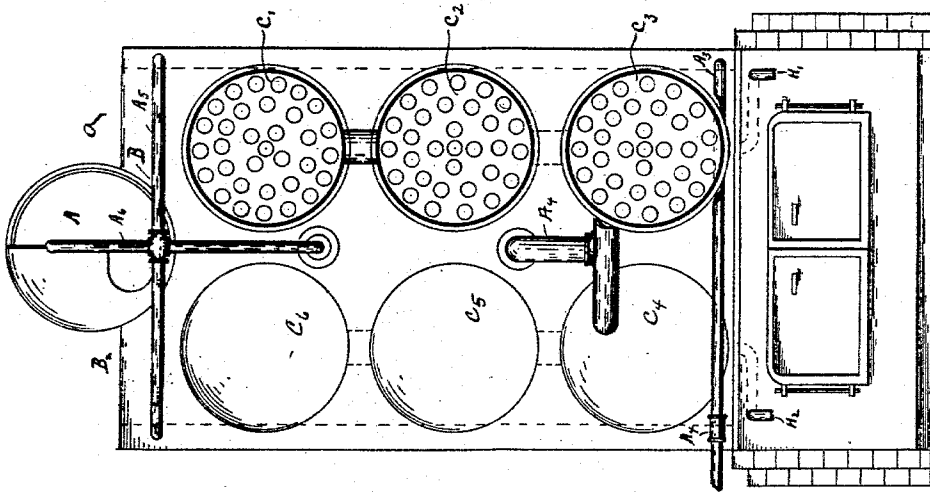


Fig. 1.

WITNESSES:

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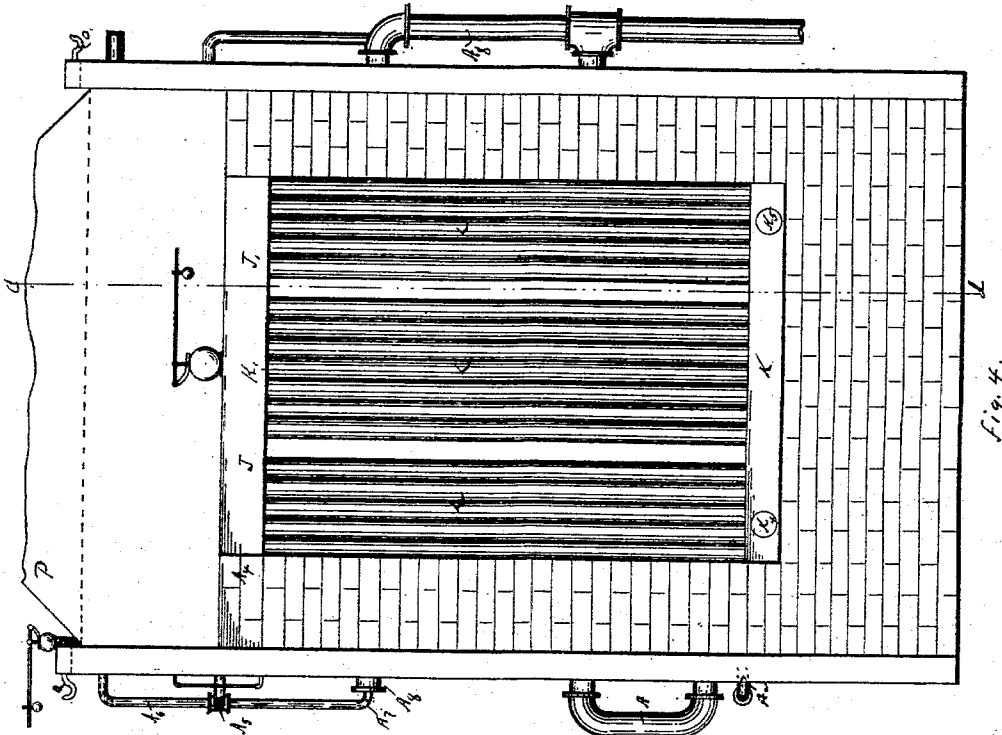


Fig. 4.

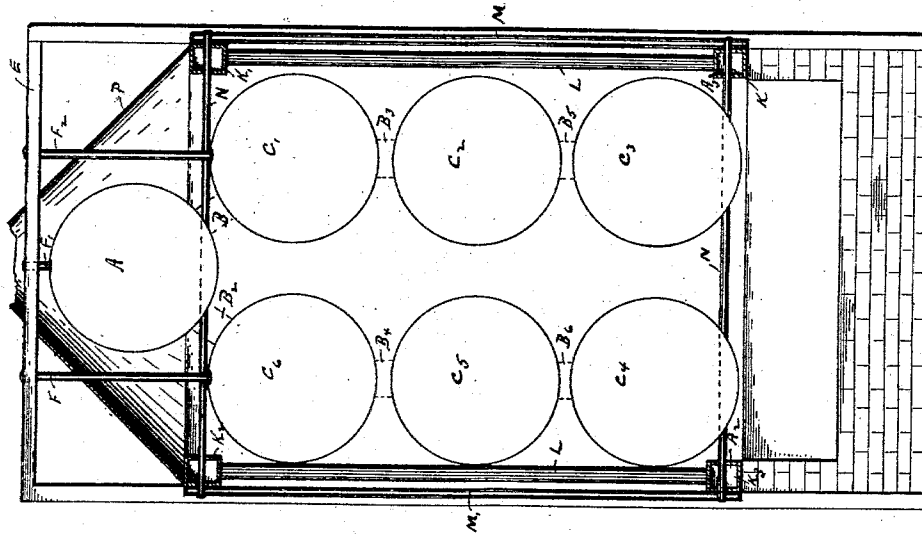


Fig. 3.

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(No Model.)

3 Sheets—Sheet 3.

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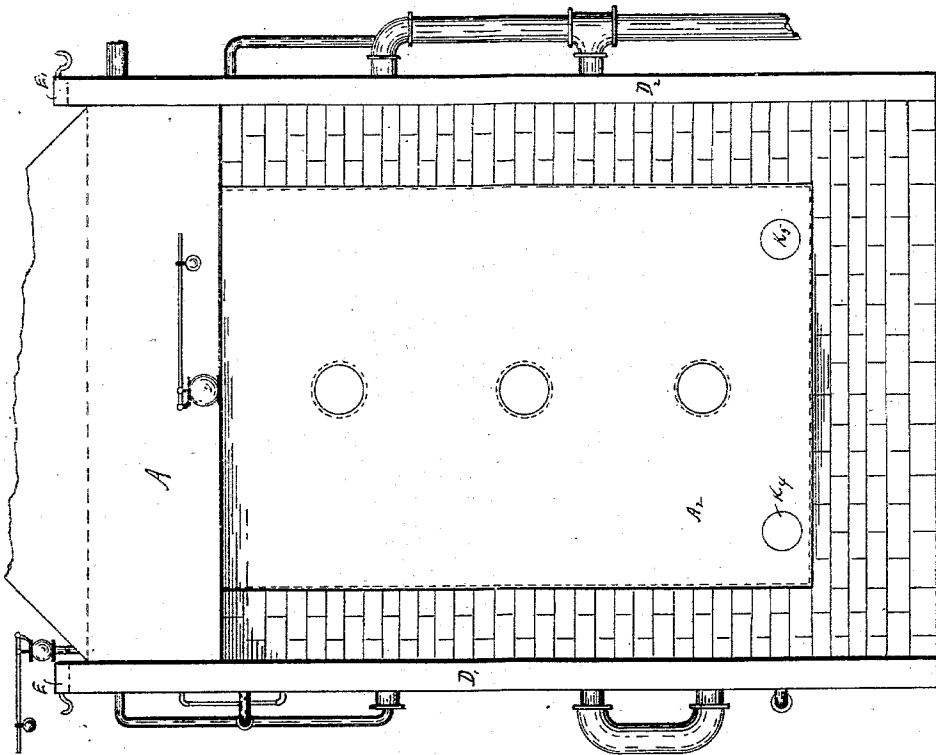


Fig. 6.

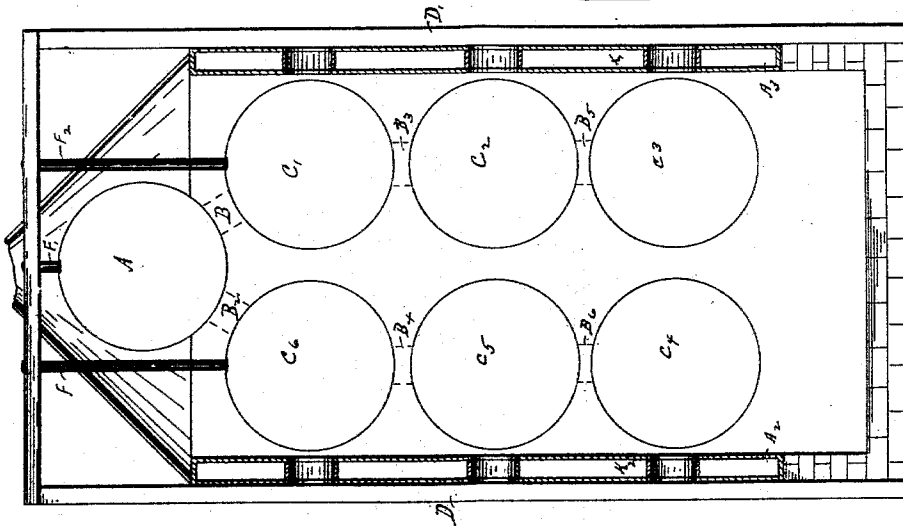


Fig. 5.

WITNESSES:

C. E. And
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UNITED STATES PATENT OFFICE.

WAUSBROUGH BLOXHAM, OF ATLANTA, GEORGIA.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 548,624, dated October 29, 1895.

Application filed May 7, 1894. Serial No. 510,430. (No model.)

To all whom it may concern:

Be it known that I, WAUSBROUGH BLOXHAM, a citizen of the United States, residing at Atlanta, in the county of Fulton, State of Georgia, have invented new and useful Improvements in Water-Tube Boilers, of which the following is a specification.

My invention relates to improvements in what are known as "sectional water-tube boilers."

The objects of my invention are, first, to provide a water-tube boiler all of whose parts are readily accessible; second, to afford facilities for readily taking off and replacing the boiler-head in lieu of using manholes, a third object being to provide a combination water-tube boiler and water-purifier. These objects I attain by use of the parts shown in the accompanying drawings, in which—

Figure 1 is a front elevation with parts of the drum-heads off, showing the ends of the tubes. Fig. 2 is a vertical section through center of steam-drum A, thence along center of pipe B, and thence on *a b* through centers of boilers *C' C' C'*. Fig. 3 is a section on *c d*, Fig. 4, showing the smoke-conveyer, the methods used to suspend the boilers, and the feed-boxes. Fig. 4 is a side elevation of same. Figs. 5 and 6 show, respectively, a section and side elevation of another method I can use for my feed-water box and purifier, the details of which will be explained hereinafter; but I prefer to use the arrangement shown in Figs. 3 and 4.

Similar letters refer to similar parts throughout the several views.

The columns *D D' D'* and beams *E E'* constitute the framework from which the steam-drum A and boilers are suspended by means of rods *F F' F'*.

My boiler proper consists of a number of tubes expanded into a steel plate G, said plate being riveted to and forming one end of cylindrical drum or tube-box H. The tube-box or drum H has a flange I around one end, to which is bolted the cast-steel plate J, which forms the boiler-head. A ground joint between flange I and plate J will prevent leakage, as in the steam-cylinder head. The lower drums H are supported by the masonry which forms the furnace-walls, and upper drums H are supported by masonry which in turn is

carried by the drums just below, or the whole weight of the boilers may be suspended from framework, as above indicated, the masonry then serving only to form furnace-walls and carrying no weight.

The sides of the boilers are closed in, as shown in Figs. 3 and 4, in which *K K'* are hollow iron boxes set into the masonry. Connected to these boxes by means of vertical tubes *L L'* are similar boxes *K' K'*, the boxes *K' K'* being placed as high as it is desired to have the water-level in steam-drum A. At convenient intervals I leave out one tube, making a space large enough to get one's hand into when it becomes necessary to sweep off the outside of the water-tubes.

On the outside of and close to the vertical tubes *L L'* are placed boxes *M M'*, made of thin sheet metal and asbestos, extending along the entire length and height of space covered by tubes *L L'*. These boxes *M M'*, being held together by bolts or buck-stays *N N'*, form the side casing for the boilers, preventing the fire in the furnace escaping through spaces left between vertical tubes *L L'*.

Figs. 5 and 6 show boxes *K' K'*, extending entirely along the sides of the boilers, an arrangement substantially the same as shown in Figs. 3 and 4. Each system of tubes is connected with the system directly above by pipe-connections *B⁶ B⁵ B⁴ B³*, these pipes alternating from back to front end, excepting that the last system of tubes is connected to steam-drum A, with pipes *B B²* at both ends.

At some convenient place on the beams E there are fastened hooks *O O'*, which will support a pulley-block to be used in lifting off the plates J when necessary.

The steam-drum A is fitted with a water and steam gage and safety-valve, as in all ordinary practice. The smoke-conveyer P entirely covers the length and breadth of the water-tubes and is reduced to the correct area above the top of steam-drum A.

The circulation of water in my boiler is as follows: The feed-water enters boxes *K K'*, Figs. 3 and 4, at any convenient place, as at *A² A³*, and is forced by means of the feed-pump through the vertical tubes *L L'* into the upper boxes *K' K'*. From the boxes *K' K'* the water flows through pipes *A⁴ A⁵* to connecting-pipes *A⁶ A⁷*, one branch *A⁶* leading to

the steam-drum A and the other branch A⁷ leading to pipe A⁸. The pipe A⁸ runs between the boilers, on the inside of the furnace, to back end of boiler, there connecting with elbow, thence down to T A¹⁰, and from there runs along between boilers to Y A¹¹, then connecting with cylindrical drums H. The water flows through this system to the drums and thence into the two lower sections of tubes C³ C⁴, thence through connections B⁵ B⁶ to tubes C² C⁵, thence through connections B³ B⁴ to tubes C¹ C⁶, thence into steam-drum A through connections B B². The passage of the steam generated in the lower boilers is identical with that of the water in rising through the several connections until it reaches the steam-drum A.

It is a well-known fact that the application of heat to water will cause it to deposit its impurities held in solution, and I take advantage of this fact to purify the water before it enters the boilers, as follows: The vertical tubes L L', forming the sides of the furnace, are very naturally kept hot, and as these tubes are also the feed-tubes for the boiler, the water in passing through them on its way to the boilers will become heated and deposit its impurities, which will fall into the boxes

K K³ and is cleaned out as occasion demands, hand-holes K⁴ K⁵ being put into the box for this purpose. There may also be a blow-off cock attached to the boxes K K³ at any convenient place to assist in draining and cleaning the boxes and tubes L L'.

The feed-box K' is provided with a safety-valve to allow the escape of steam that may be generated in the vertical tubes L L'.

The lower drums H are provided with blow-off cocks H' H², as in all ordinary practice.

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

1. The combination, in a water tube boiler, of the feed boxes K, K³, K', K², the tubes L, L', the feed pipes A⁷, A⁸ and drum H, all arranged substantially as herein described.

2. A combination boiler casing and water purifier consisting of boxes K', K², K³, K, and vertical tubes L, L' and sheet metal boxes M, M' all arranged and working substantially as set forth.

WAUSBROUGH BLOXHAM.

Witnesses:

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G. E. BAILEY.