(No Model.)

H. H. KELLEY.

BOILER.

No. 526,575. Patented Sept. 25, 1894.

Fig. 1.

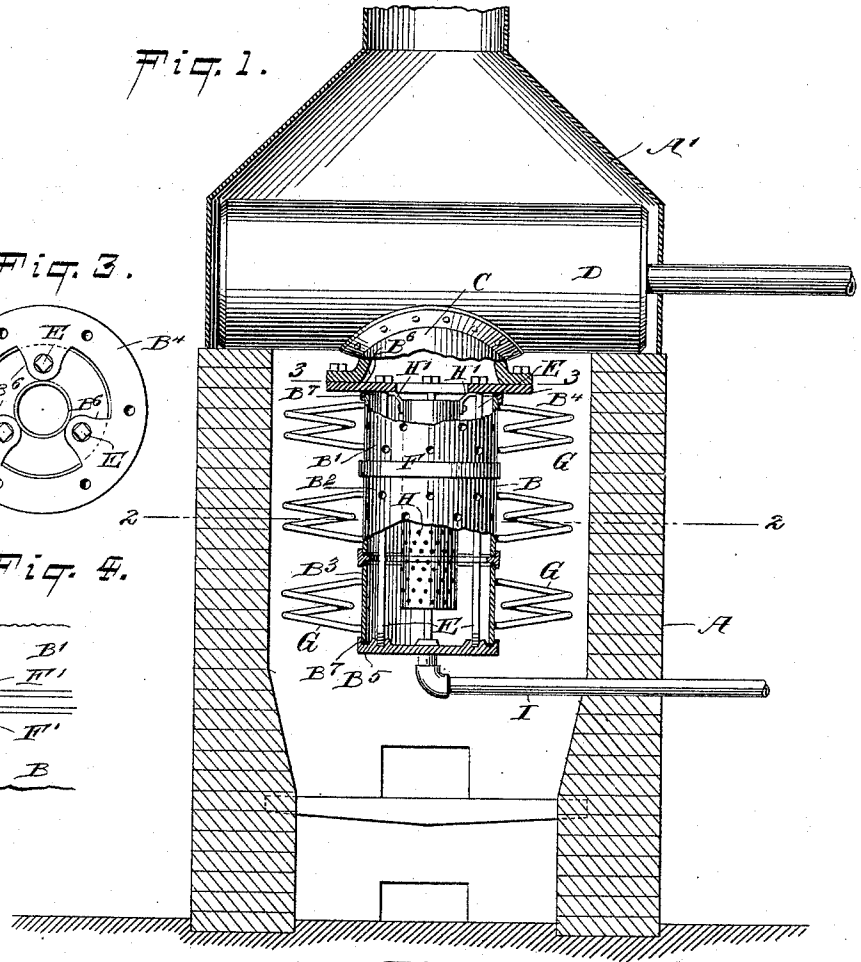


Fig. 3.

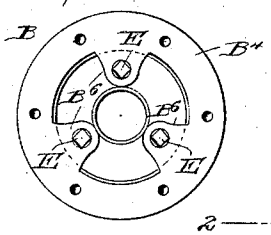


Fig. 4.

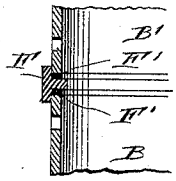


Fig. 2.

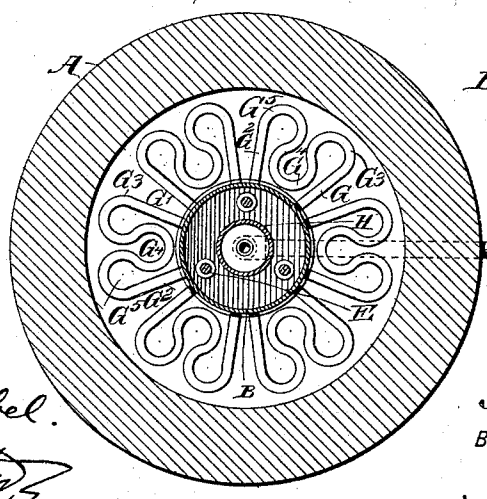


Fig. 5.

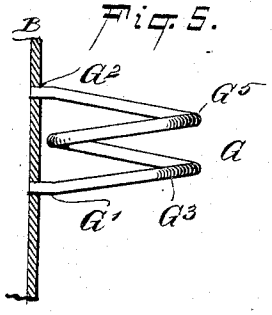
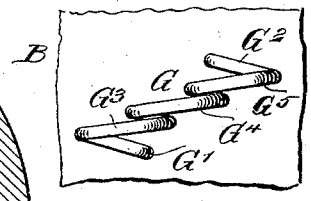


Fig. 6.



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HARRY H. KELLEY, OF ELYRIA, OHIO.

BOILER.

SPECIFICATION forming part of Letters Patent No. 526,575, dated September 25, 1894.

Application filed June 6, 1894. Serial No. 513,640. (No model.)

To all whom it may concern:

Be it known that I, HARRY H. KELLEY, of Elyria, in the county of Lorain and State of Ohio, have invented a new and Improved Boiler, of which the following is a full, clear, and exact description.

The object of the invention is to provide certain new and useful improvements in steam boilers, whereby the water is quickly heated, and steam generated with a comparatively small consumption of fuel.

The invention consists principally of a steam drum from which depends a shell containing a cylinder perforated at its lower end and adapted to receive the feed water. The invention further consists of a specially constructed water-circulating pipe arranged exteriorly on the shell.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a sectional plan view of the same, on the line 2—2 of Fig. 1. Fig. 3 is a plan view of the shell as detached, on the line 3—3 of Fig. 1. Fig. 4 is an enlarged sectional side elavation of the joint between two shell sections. Fig. 5 is an enlarged side elevation of one of the water-circulating pipes as applied on the shell, the latter being in section; and Fig. 6 is a front elevation of the same.

The improved boiler is provided with the usual brick work or setting A, containing the fire box, fuel doors, ash pits, &c., for burning fuel to heat the water contained in a shell B secured at its upper end on a collar C, pivoted or otherwise fastened to the under side of a horizontally disposed steam drum D, supported on top of the brick work A, and covered by a hood A'.

The shell B is preferably made in sections B', B^2 and B^3, of which the upper and lowermost sections B' and B^3 are provided with heads B^4 and B^5 respectively, connected with each other by stay bolts E, passing through the shell B, and having their lower ends threaded in bosses on the top of the head B^5, as plainly shown in Fig. 1. The upper ends of the stay bolts E engage lugs B^6 projecting inwardly from the head B^4, as plainly indicated in Figs. 1 and 3. Both heads are formed with flanges B^7, engaging the outside of the shell sections, so as to form a proper joint, the ends of the shell sections resting on suitable gaskets supported on the heads next to the said flanges B^7. The several sections are connected with each other by joints, shown in detail in Fig. 4, each joint being provided with a ring F, made T-shape in cross section, to form at its middle portion a seat for metallic gaskets F', on which rest or abut the edges of the adjacent sections, the said edges also abutting against the flanges formed by the ring F, as will be readily understood by reference to Fig. 4.

The shell B is provided with exterior water circulating pipes G, having their straight ends G' and G^2 connected with the shell in such a manner that the ends are located one above the other and to one side, as plainly indicated in Fig. 6. The end G' terminates in a loop G^3, from which extends inwardly a second loop G^4, connected with a loop G^5 on the outer end of the end G^2, so that the three loops G^3, G^4, G^5, are arranged in step form to connect the ends G', G^2 with each other in an inclined direction. By this arrangement the pipes G form resisting or baffling pipes for the rising heat, to insure a complete use of the fuel burned in the furnace and to cause a quick heating of the water and generating of the steam, and a comparatively slow circulation of the water through the pipes.

Within the shell B is arranged a cylinder H, supported at its upper end by short stays H' from the lugs B^6 previously mentioned and formed on the head B^4, so that the upper end of the said cylinder H is a short distance below the under side of the head, as will be readily understood by reference to Fig. 1. Into this upper end of the cylinder H discharges the feed water pipe, and the lower end of the said cylinder is perforated to permit the cold water fed into the cylinder to pass out at its lower end, to then rise and circulate through the pipes G and the shell B, to generate steam, as previously described.

From the lower head B^5 leads a blow-off pipe I, for cleaning the shell of sediment whenever necessary.

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

1. A boiler, comprising a steam drum in the upper part of the furnace, a shell depending from the said drum into the furnace, and a cylinder suspended in the said shell and adapted to receive the feed water and discharge it into the shell, substantially as shown and described.

2. A boiler, comprising a steam drum in the upper part of the furnace, a shell depending from the said drum into the furnace, and a cylinder suspended in the said shell and adapted to receive the feed water, the lower end of the said cylinder being perforated, substantially as shown and described.

3. A boiler, comprising a steam drum, a collar or neck fastened to the under side of the said drum, and a shell held on the said collar and provided with exterior water-circulating pipes having their upper and lower ends entering the interior of the shell, the said circulating pipes being angularly disposed on the shell, substantially as shown and described.

4. A boiler, provided with exterior water-circulating pipes having their straight ends connected with the interior of the shell, and terminating in loops connected by a third loop with each other, the said loops being arranged in step form, substantially as shown and described.

5. A boiler, provided with a vertically disposed shell made in sections, heads held on the end sections and connected with each other by stay bolts the upper head opening into the bottom of the boiler, and the said shell depending into the boiler furnace, and a cylinder suspended within the shell from the lowermost head, the lower end of the said cylinder being perforated, substantially as shown and described.

HARRY H. KELLEY.

Witnesses:
CHARLES W. JOHNSTON,
JAMES H. LEONARD.