

No. 621,350.

Patented Mar. 21, 1899.

J. F. KLUGH.

BOILER.

(Application filed May 14, 1898.)

(No Model.)

FIG. 1.

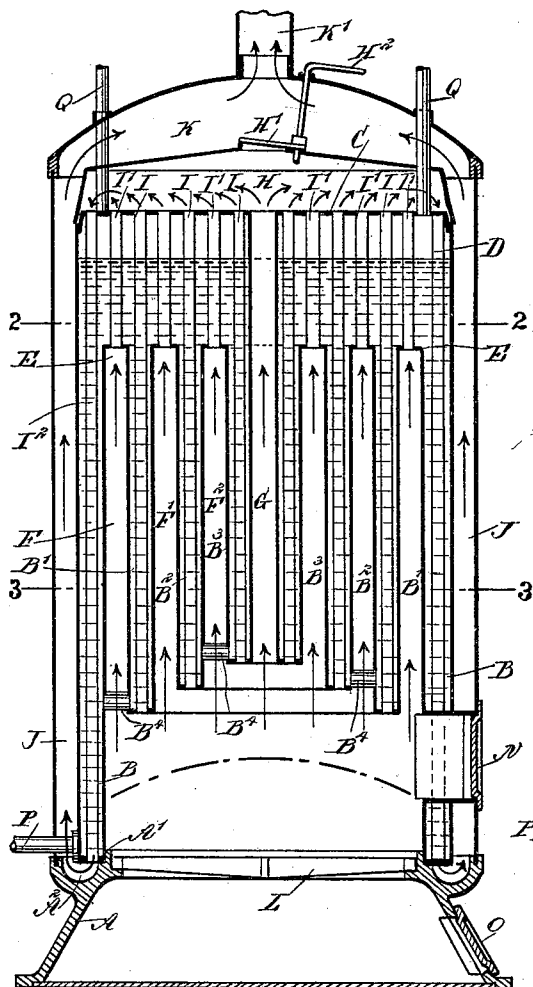


FIG. 2.

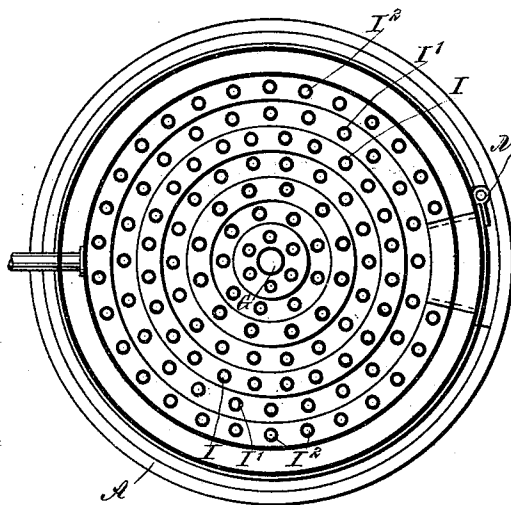
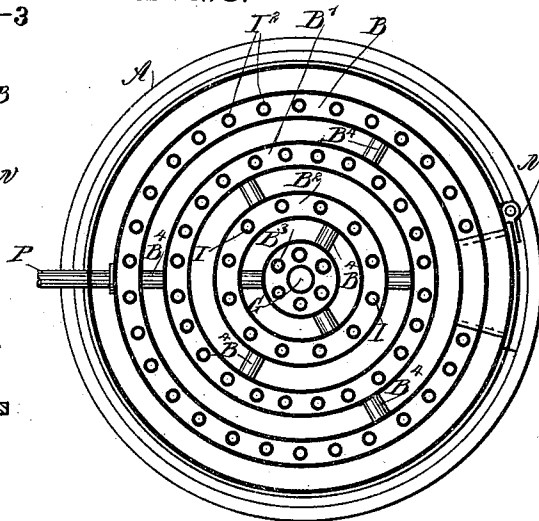


FIG. 3.



WITNESSES:

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JACOB F. KLUGH, OF HIGHSPIRE, PENNSYLVANIA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 621,350, dated March 21, 1899.

Application filed May 14, 1898. Serial No. 680,732. (No model.)

To all whom it may concern:

Be it known that I, JACOB F. KLUGH, of Highspire, in the county of Dauphin and State of Pennsylvania, 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 a new and improved boiler arranged to insure a rapid circulation of the water, to provide a large heating-surface, and to utilize the fuel to the fullest advantage for generating steam in a comparatively short space of time.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter 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 characters of reference indicate corresponding parts in all the figures.

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, and Fig. 3 is a similar view of the same on the line 3 3 of Fig. 1.

The improved boiler is mounted on a base A, preferably made circular in shape and formed at its top with an annular seat A', on which rests the lower inner end of a water-section B, made circular in shape and closed at its top by a crown-sheet C. Concentric to the water-section B are arranged similar sections B' B² B³, which terminate at their lower ends a suitable distance above the lower end of the water-section B, so as to provide space for the fire-box, as will readily be understood by reference to Fig. 1.

The upper open ends of the water-sections B B' B² B³ open into a water or steam compartment D, of which the crown-sheet C forms the top and of which part of its bottom is formed by ring-plates E, connecting the adjacent edges of adjacent water-sections with each other.

By the arrangement described annular heating-spaces F F' F² are formed between adjacent water-sections, and a flue G is formed by the innermost water-section B³, said flue extending up through the water or steam compartment D and the crown-sheet C to open into a heat and smoke box H, arranged over the crown-sheet C.

The lower closed ends of the water-sections B' B² B³ are connected with adjacent water-sections by branch pipes B⁴, so that the water can circulate from one water-section to the other to insure a proper circulation of the water in the boiler. Pipes I extend through the said water-sections B' B² B³ and the water or steam compartment D, and similar pipes I' lead from the bottom ring-plates E through the crown-sheet C to connect the heating-spaces F with the heat and smoke box H. The pipes I are completely surrounded by water in the water-sections B' B² B³, so that the heat, smoke, and gases arising from the fire-box through said pipes readily give off their heat to the water in the water-sections to insure a quick generation of steam, especially as said water is also heated from the heat in the spaces F F' F² and the flue G. A set of pipes I², similar to the pipes I I', extend through the outermost water-section B, so as to connect the heat and smoke box H with an annular groove A², formed in the top of the base A and leading to a draft and heating chamber J, surrounding the water-section B and opening at its upper end into a dome K, from which leads a chimney or stack K' for carrying off the smoke and gases to the outer air. The shell for forming the draft and heating chamber J is seated on the base A, as plainly shown in Fig. 1, so that the heat, smoke, and gases from the heat and smoke box H and passing down the pipes I² can pass up in the draft and heating chamber J to finally reach the dome K and pass from the latter out to the open air. As the said chamber J surrounds the outermost water-section B, the smoke and gases readily heat the water contained in said water-section during their upward passage in the draft and heating chamber.

The bottom of the fire-box is formed by the usual grate L, supported in the top of the base A, and a fire-door N opens into said fire-box, as shown in the drawings. The base A is also provided with a door O, leading to the ash-pit formed in the bottom of the base, for removing the ashes whenever desired, regulating the draft, and supplying fresh air under the fire-box.

The feed-water for the boiler is delivered by pipes P into the lowermost end of the wa-

ter-section B, and the steam generated in the boiler and accumulating in the upper portion of the water and steam compartment D is carried off by suitable pipes Q.

5 The top of the heat and smoke box H is provided with a valve H', controlled by a handle H² from the outside, to connect the smoke-box directly with the dome K, whenever desired, by turning the handle K² to the proper
10 position. Normally, however, the valve H' is closed, so that the heat, smoke, and gases rising from the fire-box up through the heating-spaces F F' F² and the flue G, as well as the pipes I I', pass into the smoke-box H and
15 then down through the pipes I² into the groove A² to then rise upwardly in the draft and heating chamber J, and finally pass into the dome K and to the chimney flue or stack K'.

By the arrangement described the heat is
20 only required to penetrate a thin sheet or body of water in any part of the boiler, thereby almost instantly converting the water into steam with a minimum amount of heat, thereby using the fuel very economically. It is
25 understood that by the construction described an extra large heating-surface is produced, as the pipes I I' pass through the water and heating chambers formed between the sections B B' B² B³.

30 It is evident that any desired number of water-sections can be employed, and by the construction described I can readily adapt any one of the well-known forms of heating devices to produce heat from wood, coal, gas,
35 gasolene, electricity or other heat-producing medium.

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

40 1. A boiler comprising a series of concentric circular water-sections, closed at the bottom and open at the top, and of which the outermost section is extended below the others to provide space for a fire-box, the sections being connected with each other at or
45 near their lower ends, and a water and steam compartment in which terminate the upper, open ends of the said sections, the bottom of said compartment connecting the upper edges
50 of adjacent sections with each other, substantially as shown and described.

2. A boiler comprising a series of concentric circular water-sections, closed at the bottom and open at the top, and of which the
55 outermost section is extended below the others to provide space for a fire-box, the sections being connected with each other at or near their lower ends, a water and steam compartment in which terminate the upper, open
60 ends of the said sections, the bottom of said compartment connecting the upper edges of adjacent sections with each other, pipes extending through the said sections and compartment, and a heat and smoke box into
65 which open said pipes, substantially as shown and described.

3. A boiler comprising a series of concentric

70 circular water-sections, closed at the bottom and open at the top, and of which the outermost section is extended below the others to provide space for a fire-box, the sections being connected with each other at or
75 near their lower ends, a water and steam compartment in which terminate the upper, open ends of the said sections, the bottom of said compartment connecting the upper edges of adjacent sections with each other, pipes extending through said sections and compartment, and a second set of pipes leading from
80 the heat-spaces through said compartment, and a heat and smoke box into which open all the pipes, substantially as shown and described.

4. A boiler comprising a base formed with a seat and an annular groove, a series of concentric circular water-sections, closed at the
85 bottom and open at the top, the outermost section extending below the others and seated on said base, a grate on said base to form a fire-box surrounded by the lower portion of the outermost section, a fire-box opening into
90 the heating-space between adjacent sections, a water and steam compartment into which open the upper ends of said sections, a heat and smoke box on the top of said compartment, pipes leading from the heating-spaces
95 to said heat and smoke box, a second set of pipes extending through the sections and said compartment, to open into the heat and smoke box, pipes in the outermost section, opening at their lower ends into the groove
100 of the base, and a draft and heating chamber surrounding the outermost section and connected with said groove to receive the heat, smoke and gases from the pipes in the outermost section, substantially as shown and described.
105

5. A boiler comprising a base formed with a seat and an annular groove, a series of concentric circular water-sections, closed at the
110 bottom and open at the top, the outermost section extending below the others and seated on said base, a grate on said base to form a fire-box surrounded by the lower portion of the outermost section, a fire-box opening into
115 the heating-space between adjacent sections, a water and steam compartment into which open the upper ends of said sections, a heat and smoke box on the top of said compartment, pipes leading from the heating-spaces
120 to said heat and smoke box, a second set of pipes extending through the sections and said compartment, to open into the heat and smoke box, pipes in the outermost section, opening at their lower ends into the groove
125 of the base, a draft and heating chamber surrounding the outermost section, and connected with said groove, to receive the heat, smoke and gases from the pipes in the outermost section, and a dome into which opens the said
130 draft and heating chamber, substantially as shown and described.

6. A boiler comprising a base formed with a seat and an annular groove, a series of concentric

centric circular water-sections, closed at the bottom and open at the top, the outermost section extending below the others and seated on said base, a grate on said base to form a
5 fire-box surrounded by the lower portion of the outermost section, a fire-box opening into the heating-space between adjacent sections, a water and steam compartment into which open the upper ends of said sections, a heat
10 and smoke box on the top of said compartment, pipes leading from the heating-spaces to said heat and smoke box, a second set of pipes extending through the sections and said compartment, to open into the heat and

smoke box, pipes in the outermost section, 15 opening at their lower ends into the groove of the base, a draft and heating chamber surrounding the outermost section, and connected with said groove, to receive the smoke and gases from the pipes in the outermost section, 20 a dome into which opens the said draft and heating chamber, and a valved connection between said heat and smoke box and said dome, substantially as shown and described.

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Witnesses:

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A. D. KLUGH.