

A. A. OLSON.
STEAM BOILER.
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967,961.

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Fig. 2.

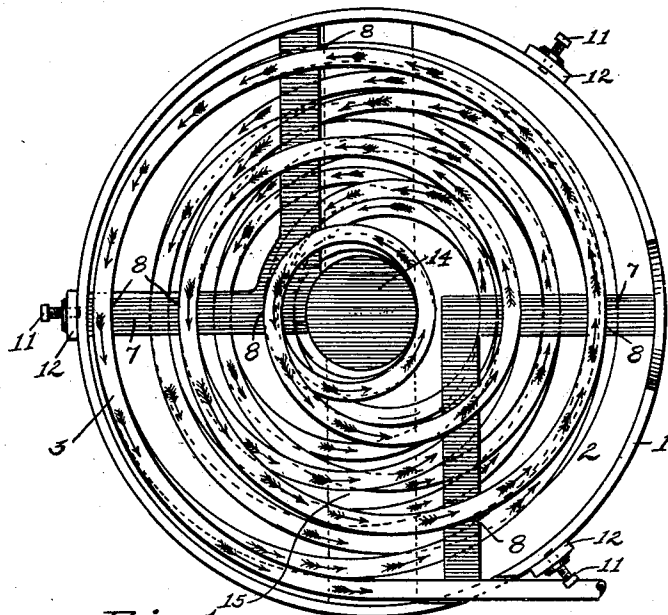
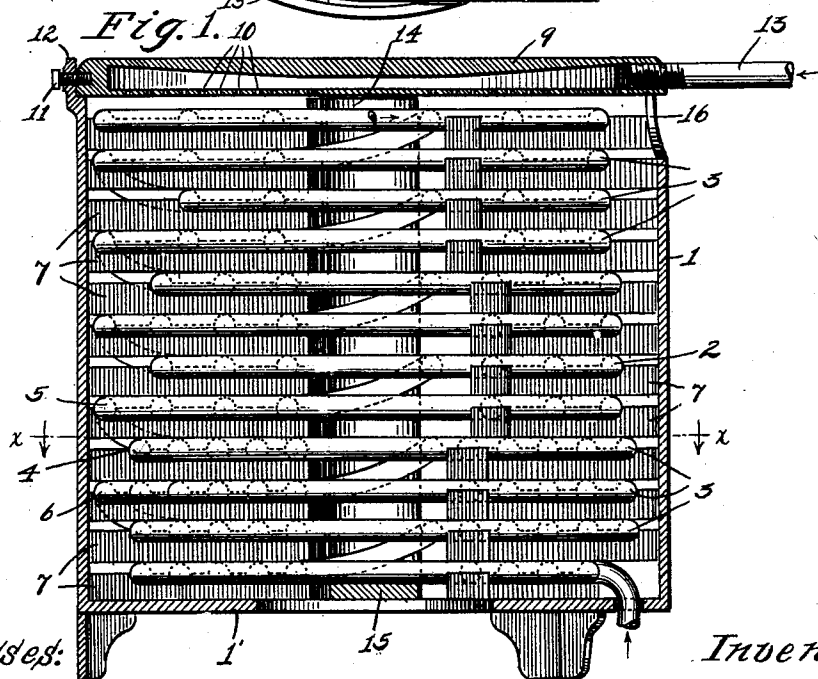


Fig. 1.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALFRED A. OLSON, OF RIVERSIDE, ILLINOIS.

STEAM-BOILER.

967,961.

Specification of Letters Patent.

Patented Aug. 23, 1910.

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To all whom it may concern:

Be it known that I, ALFRED A. OLSON, a citizen of the United States, residing at Riverside, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to tubular steam boilers and more specifically to that class thereof commonly known as "flash boilers".

The object of my invention is the provision of a boiler of the character mentioned in which the heat issuing from the burner or heat emitting means employed in conjunction therewith will be directed in such a manner that the outlet coils of the boiler will be subjected to the greatest heat and the coils at the inlet end thereof will be subjected to the least amount of heat. In other words it is my object to provide a boiler in which the water, through its coiled pipe constituting the body of the former, from the lower inlet end to the upper exhaust end thereof will be gradually subjected to a more and more intense heat, the climax of intensity of the heat to which the water is subjected being reached when the latter has ascended to the exhaust end of the pipe.

A further object is the provision of a boiler as mentioned which will be durable, compact, and of the highest possible efficiency.

Other objects will appear hereinafter.

With these objects in view my invention consists in a tubular boiler characterized as above mentioned and in certain details of construction and arrangement of parts all as will be hereinafter fully described and particularly pointed out in the appended claims.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a partially sectional side elevation of my boiler, and Fig. 2 is a top plan view thereof, the burner being removed.

Referring now to the drawings 1 indicates a legged cylindrical metallic housing or shell, upon an inwardly extending flange 1', provided at the lower extremity of which, is supported the tubular body 2 of the boiler. Comprised in said body is a series of vertically alining horizontally disposed flat coils 3, connected one to the other to

form a single continuous passage. Each of said coils is connected at its inner and outer convolutions with the respective coils positioned immediately adjacent thereto. For instance, the coil 4, as clearly shown in Fig. 1, is connected at its outer convolution with the outer convolution of the coil 5 or that coil positioned immediately above the same, and at its inner convolution with the inner convolution of the coil 6, or that coil positioned immediately below the same. Arranged between the coils are angular spacing members 7 in the upper surfaces of which are provided substantially semi-circular curved recesses 8 for the reception of the convolutions of the coils positioned above the same, thereby adapting said members to serve not only in the capacity of means for spacing adjacent coils apart, as stated, but also as a means for spacing apart the convolutions of said coils.

Supported in the upper extremity of the housing 1 is a circular gas burner 9 provided with emission openings 10 in its under side. Said burner is secured in said housing by set screws 11 threaded in ears 12 formed at the upper extremity of said housing. Gas under high pressure is fed into said burner through the pipe 13, when the device is in operation, hence the flame supported thereby will be directed downwardly therefrom through the interstices formed in the coiled body. In order that the flame or heated gases be prevented from passing down the cylindrical opening formed centrally in the body 1, since in such event a considerable proportion of the heat would escape unutilized, a cylindrical member or core 14 is arranged therein. The latter is supported upon a cross bar 15 arranged upon the flange 1' of the housing 1.

Because of the advantage of subjecting the upper or outlet end of the body 2 with the most intense heat and further so as not to too greatly restrict the gas passages from the burner to the remoter coils of said body; in other words, in order to effect the most effectual permeation of the heat through said body, the coils of the latter, it will be observed by reference to Fig. 4, from the lowermost upwardly are gradually reduced with reference to the number of convolutions comprised in each.

An opening 16 is provided at the upper extremity of the housing 1 whereby ready

access to the burner may be gained when desiring to light the latter preparatory to the operation of the device.

The operation of the device is as follows:

- 5 Water is introduced at the lower end of the tubular body 1 and is forced upwardly through the latter by any external means such as a pump or the like. In its upward passage through said body, said water, as
10 before described, is gradually subjected to a more and more intense heat, the same leaving the upper or exhaust end of said body in the form of steam, which is immediately conveyed to the engine or other mechanism in
15 conjunction with which the boiler is used.

- By passing the heat downwardly over the coils and the water upwardly therethrough, the cool incoming water is subjected to the coolest portion of the applied heat and the
20 superheated steam to the hottest portion of said heat, and the escape of the steam from the water and its passage through the system is facilitated. The cool incoming water will extract heat from the coolest portion
25 of the applied heat with greater effect than the superheated steam would, since the relative difference in temperature is greater, and the steam generated may pass freely upward which is its natural tendency.

- 30 While I have shown what I deem to be the preferable form of my boiler I do not wish to be limited thereto as there might be various changes made in the details of construction and arrangement of parts without
35 departing from the spirit of the invention comprehended within the scope of the appended claims.

Having described my invention what I

claim as new and desire to secure by Letters Patent is:

1. A boiler consisting of a housing; a series of connected coils arranged therein, one above the other, the number of convolutions in said coils decreasing from the lowermost to the uppermost; a burner at the top of
45 said housing immediately adjacent the top of said coils and arranged to project its flame downwardly over said coils; a water supply connection with the lowermost of
50 said coils; and a steampipe connection with the uppermost coil, substantially as described.

2. A boiler consisting of a housing; a series of connected coils arranged therein, one above the other, the number of convolutions
55 in said coils decreasing from the lowermost to the uppermost; oppositely disposed angular spacing members interposed between such coils and provided with recesses adapted to receive the convolutions of said coils; a
60 central cylindrical core arranged in the center of said coils; a burner at the top of said housing immediately adjacent the top of said coils and arranged to project its flame downwardly over the said coils; a
65 water supply connection with the lowermost of said coils; and a steampipe connected with the uppermost coil, substantially as described.

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

ALFRED A. OLSON.

Witnesses:

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JOSHUA R. H. PORTS.