P. L. GUNCKEL.

HEATING BOILER.

APPLICATION FILED JAN. 17, 1914.

1,142,323. Patented June 8, 1915.

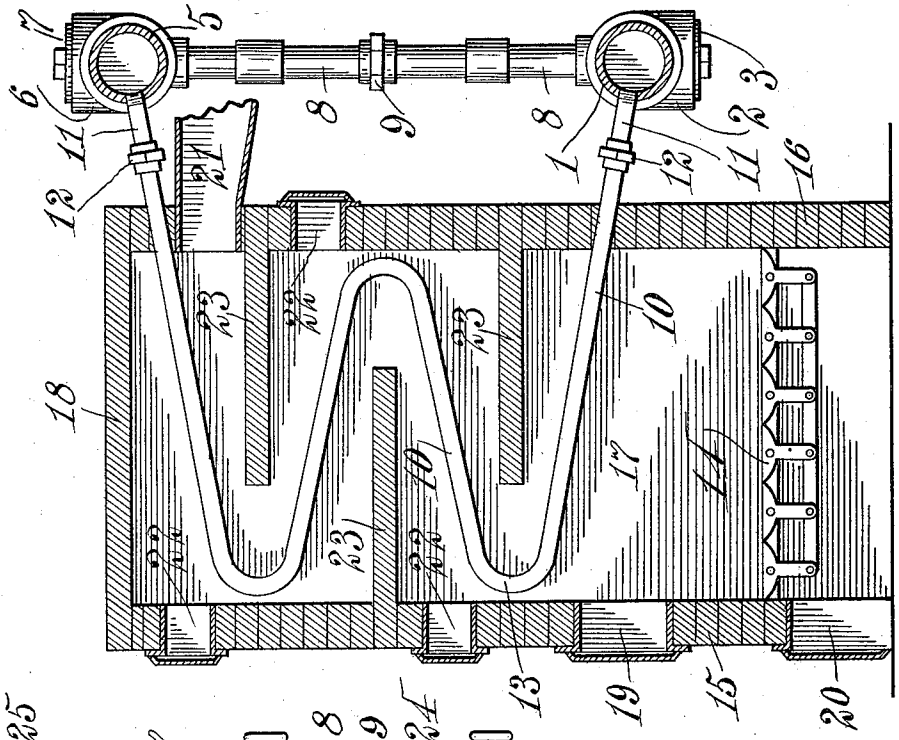


Fig. 2.

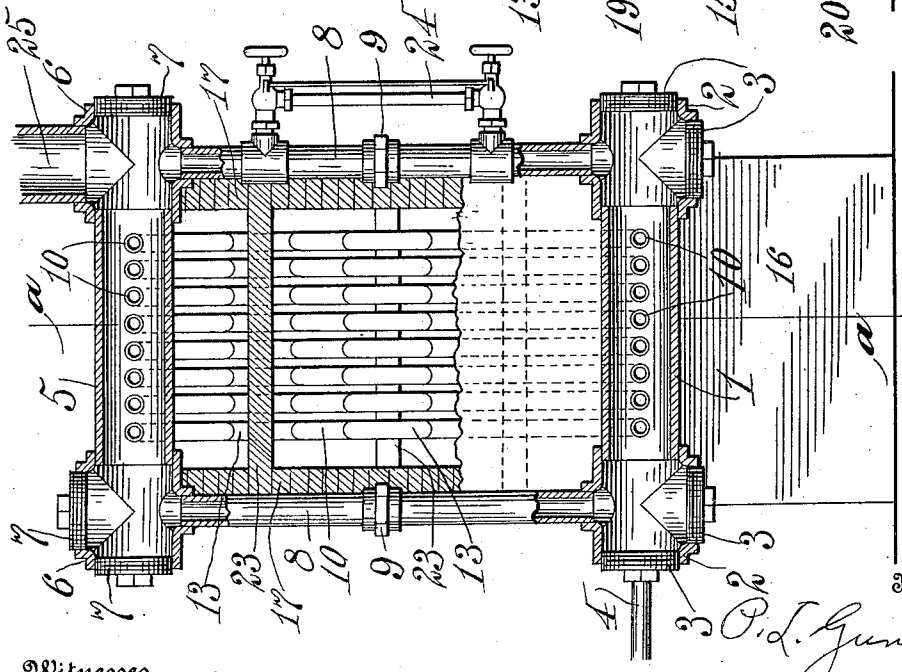


Fig. 1.

Witnesses

M. Sibley

Millie Galloway

Inventor

P. L. Gunckel

By R. J. McCarty

his

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PEARL L. GUNCKEL, OF DAYTON, OHIO.

HEATING-BOILER.

1,142,323. Specification of Letters Patent. Patented June 8, 1915.

Application filed January 17, 1914. Serial No. 812,631.

To all whom it may concern:

Be it known that I, PEARL L. GUNCKEL, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Heating-Boilers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in boilers of the water tube type and is adapted for heating installations through the medium of water or steam.

The object of the invention is to provide a device of this type which is simple in construction and efficient in operation and which possesses the features hereinafter described and claimed.

Referring to the accompanying drawings, Figure 1 is a rear elevation of my invention partially in section and with parts of the casing broken away; and Fig. 2 is a section on the line *a*—*a* of Fig. 1.

In the specification and drawings, similar reference characters indicate corresponding parts.

Referring more particularly to the drawings, the boiler is provided with a lower or inlet header consisting of intermediate pipe portion 1 and end portions 2 which are conveniently formed of standard T-fittings. Some of the openings of said T-fittings are closed by plugs 3 which permit the inlet header to be cleaned. One of the plugs 3 receives an inlet or return pipe 4 through which the water is introduced to said header and thence to the heating pipes. The pipe 4 may, however, be connected to any portion of said inlet header. The boiler is also provided with an upper and similar discharge header which consists of an intermediate pipe portion 5 and ends or T-fittings 6. The unused openings of said ends 6 are closed in a similar manner by plugs 7. One of the T-fittings 6 receives a delivery pipe 25 which connects with the heating system of the building (not shown) in which the boiler is installed. In the drawings, I have shown only one delivery pipe, but additional delivery pipes may be connected into the T-fittings. The lower and upper headers thus described are connected by side circulating pipes 8 which are provided with unions 9 to facilitate assembling. The pipes 8 form circulating passageways for the water when passing from the upper to the lower header during the circulation of the heating medium. The water or heating medium passes from the lower header to the upper header through a continuous pipe 10 which is connected into the upper and lower headers through suitable nipples 11 and unions 12 which means permits the boiler to be easily assembled. The heating pipe 10 is, as before stated, continuous and is curved as at 13 to permit said pipe to occupy a minimum of space the said pipe being bent on suitable inclines to facilitate a free circulation. As is shown in Fig. 2, the bends in the water heating pipes 10 are such as to provide ample space for the placing between the inclined portions of said pipes a series of oppositely extending baffle plates to be further referred to, and whereby there is formed a series of combustion chambers or spaces throughout the extension of said pipes. The water, it will be observed, circulates through a large but compact heating space. The pipe 10 lies above a grate 14 and is inclosed in a furnace casing consisting of a front wall 15, rear wall 16, side walls 17 and a top 18. The front wall 15 is provided with a stoking door 19 and ash door 20. The rear wall is provided with a smoke-pipe 21 extending from the upper portion of the rear wall and through which the products of combustion are conducted away from the furnace. The said smoke or outlet pipe 21, it will be observed, communicates with the space between the two uppermost runs of the heating pipes 10, or from the uppermost combustion space, and affords an indirect rather than a direct draft. By this arrangement the gases remaining in the products of combustion are retarded in their passage through the furnace and a more thorough combustion and economy in fuel is obtained. Both the front and rear walls are provided with clean-out doors 22 through which the inside of the furnace may be cleaned. To conduct the flame or gases over an extended path and to obtain the greatest possible amount of heat therefrom, the interior of the furnace is provided with a plurality of baffle plates 23. These baffle plates 23 are mounted between the ascending coils of the pipe and form a path through which the products of com-

bustion are deflected and caused to follow a circuitous path to the smoke-pipe 21 as before indicated. It will also be seen that the pipe 10 on the interior of the casing is free from joints and the bends thereof are such as to promote a free passage of the steam therethrough. Also, the spaces between the baffle plates constitute in effect combustion chambers which accumulate heat and supply it to the pipe throughout the length thereof. To ascertain the amount of water in the boiler when operating as a steam generator, a gage 24 is provided. The gage 24 is mounted on one of the side circulating pipes 8 at a point between the upper and lower headers. It is, therefore, contemplated that the lower half of the boiler shall contain the water while the upper half will contain the steam. The upper half of the boiler, therefore, acts as a superheater and provides dry steam to be delivered from the boiler to the circulating system. It will be observed that the tubes 10 are uniformly inclined upward from beginning to end and that the spaces between them is ample for the placement of the oppositely projected baffle plates 23. And it may be further stated in dwelling upon the efficiency of the apparatus that the upper header acts as a separator for the steam and water, the latter being conducted back to the lower header through pipes 8.

Having described my invention, I claim.

In a circulating boiler, the combination with a furnace casing, of upper and lower headers exterior thereto, exterior pipes connecting said headers, continuous circulating pipes on the interior of the furnace casing, said pipes being extended upwardly within said casing on inclinations and thence out of the upper portion of the furnace casing where they communicate with the upper header, a series of oppositely extended baffle plates arranged between the inclined portions of said pipes, said baffle plates together with the pipes forming a series of combustion chambers extending the height of the furnace, and an outlet pipe for the products of combustion extending through the rear wall of the furnace and communicating with the uppermost one of said combustion chambers above the uppermost baffle plate, substantially as specified.

In testimony whereof I affix my signature, in presence of two witnesses.

PEARL L. GUNCKEL.

Witnesses:

MELLIE GALLOWAY,

MATTHEW SEIBLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."