Dec. 20, 1927. 1,653,505

E. G. OFELDT

STEAM BOILER

Filed April 21, 1921

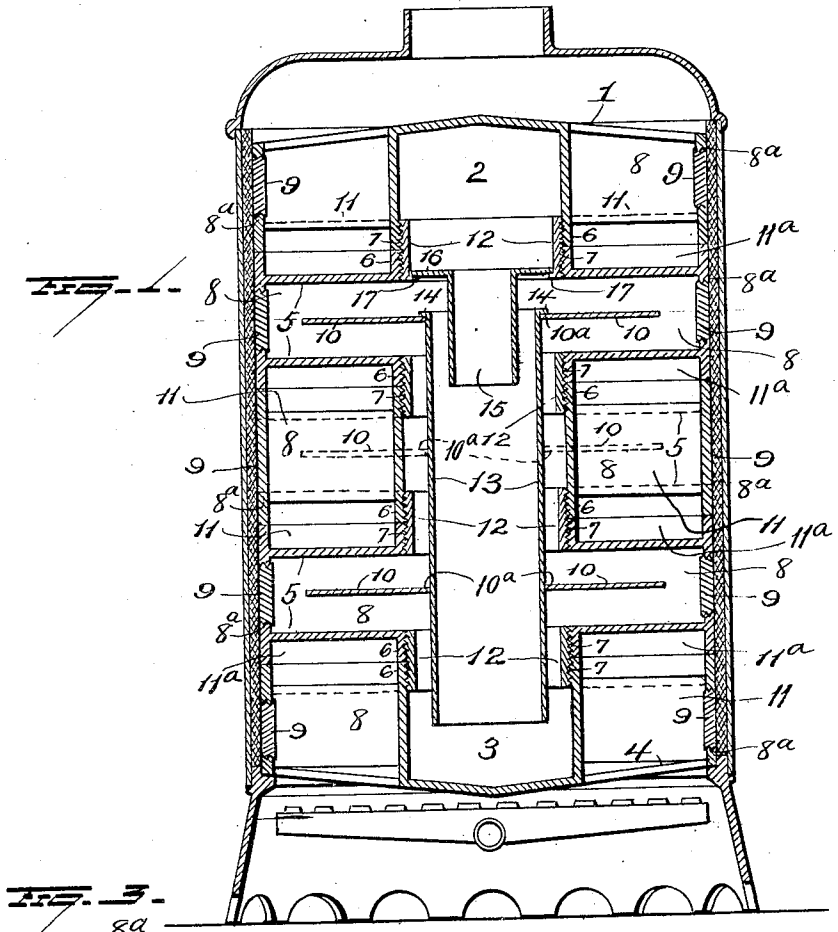


Fig. 1.

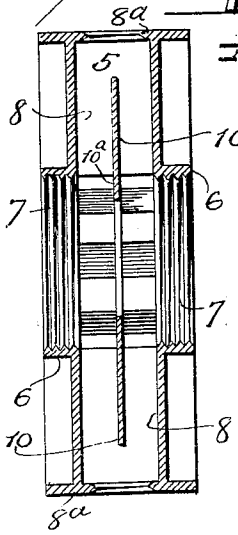


Fig. 3.

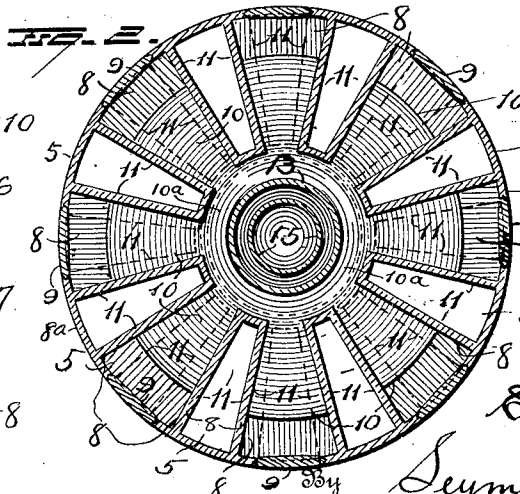


Fig. 2.

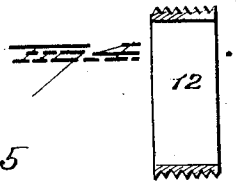


Fig. 4.

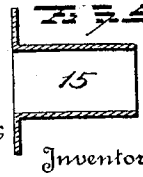


Fig. 5.

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UNITED STATES PATENT OFFICE.

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STEAM BOILER.

Application filed April 21, 1921. Serial No. 463,165.

This invention relates to improvements in steam boilers and more particularly to that type which comprises a plurality of sections secured together,—one object of the invention being to so construct a sectional boiler that the same may be easily and quickly assembled; so that an efficient water circulation shall be assured; so that extensive heating surface shall be provided, and so that all parts of the furnace structure may be readily cleaned.

With these and other objects in view, the invention consists in certain novel features of construction and combinations of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings; Figure 1 is a vertical sectional view of a boiler embodying my improvements; Figure 2 is a horizontal sectional view; Figure 3 is a sectional view of one of the units or sections of the boiler, and Figures 4 and 5 are detail views.

The boiler will preferably be made of cast iron or steel and includes a plurality of sections superimposed, one upon another. The upper section 1 of the boiler forms a steam space or dome 2 and the lower section 3 provides the bottom 4 of the boiler, while the intermediate sections 5, are constructed to facilitate the water circulation in the boiler.

Each intermediate section or unit 5 comprises, in a single casting, a hollow central or hub portion 6 which is internally threaded, as at 7, (the top and bottom sections also having threaded portions 7) and a plurality of radial, hollow arms 8 forming water chambers communicating at their inner ends with said central or hub portion,—the several radial hollow arms being connected by a circular or peripheral wall 8^a having clean-out openings at intervals to communicate with the several water chambers and these openings are normally closed by threaded plugs 9. Each intermediate section or unit 5 also includes a series of baffles 10 cast integral therewith in the hollow arms 8, the several baffles radiating from a central ring 10^a located within the central or hub portion 6 and their outer ends terminating comparatively short distances from the outer ends of said hollow arms. It will be observed that the several radiating arms of each section or unit form intermediate spaces 11, through which heated products of combustion may pass. The several sections or units of the boiler are so superimposed, one upon another, that the radial hollow arms of one section or unit will be over the spaces 11 between the radial hollow arms of the adjacent section or unit. It will be observed that the hub portions of adjacent units serve to so separate the arms of adjacent units that spaces 11^a are formed between such units and that these spaces 11^a communicate with the spaces 11 formed between arms of each unit, and that the projecting edges of the peripheral walls 8^a of adjacent units also assist in such spacing of the units. By the construction and arrangement, maximum heating surface is provided for the water arms and the efficiency of the heating is enhanced by the circuitous passage of products of combustion through the spaces 11 between the hollow arms of the several superimposed sections or units.

Each pair of sections or units may be secured together by means of externally threaded rings 12 which engage threaded portions 7 of two abutting sections or units and thus connect the same.

A centrally disposed tube 13 (open at both ends) is provided at its upper end with a flange 14 resting upon the ring 10^a of the upper series of baffles 10. The tube thus hung or supported, passes downwardly through the rings 10^a of the other baffles and terminates at its lower end above the bottom 4 of the boiler. A smaller tube 15 (open at both ends) depends into the upper portion of the tube 13 and is provided at its upper end with an annular flange 16. This flange rests upon a flange 17 at the lower end of the uppermost connecting ring 12. It will be observed that the tube 15 extends an appreciable distance into the tube 13 and that the flange 16 at the upper end of said tube 15 is at the bottom of the uppermost ring 12. The water will therefore be directed downwardly into the tube 13 and will be discharged into said tube 13 well below the upper end thereof and the steam will have free passage through the tube 15 and the ring 13 to the steam dome.

With my improvements, the water will find a circuitous path from the bottom of the boiler through the highly heated radial water arms containing baffles and will be discharged from the upper intermediate

section downwardly into the central tube 13 by which latter it will be directed toward the bottom of the boiler.

Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope and hence I do not wish to restrict myself to the precise details herein set forth.

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

1. A steam boiler comprising top and bottom sections and a plurality of intermediate sections, the top section constituting a steam dome and the bottom section constituting a receptacle for return water, means for securing the sections together, each intermediate section comprising a hollow central portion, a plurality of radial water arms and a baffle in each water arm, a central ring connecting said baffles, a tube supported by the ring of the uppermost series of baffles and extending downwardly approximately to the bottom of the boiler, said tube, communicating with the water arms of the uppermost intermediate section, and a smaller tube supported in position to communicate with the upper section and extending downwardly into the upper portion of the first-mentioned tube.

2. A steam boiler comprising top and bottom sections and a plurality of intermediate sections, said sections having central threaded portions and each having a plurality of radial hollow arms, threaded rings connecting said sections, baffles in the radial arms of each intermediate section, a ring connecting the baffles of each set, a tube open at both ends and supported by the ring of the upper set of baffles, said tube terminating at its lower end above the bottom of the boiler, and a smaller tube entering the upper portion of the first-mentioned tube, said smaller tube adapted to communicate with the top section and having an annular flange supported by the upper connecting ring.

3. A steam boiler comprising a top section constituting a steam dome, a bottom section constituting a water compartment, a plurality of intermediate sections each consisting of a central hub, a plurality of hollow radial arms extending from the hub intermediate the upper and lower ends thereof, and baffles within the hollow arms extending into the hub, a tube open at both ends extending centrally through the baffles of all the intermediate sections in concentric spaced relation to the hubs of said sections, said tube being supported at its upper end by the uppermost baffle and having its lower end within the bottom section of the boiler and all the baffles having a closed joint engagement with said tube, and means for directing water from the uppermost of the intermediate sections into the upper end of said tube.

In testimony whereof, I have signed this specification.

ERNEST G. OFELDT.