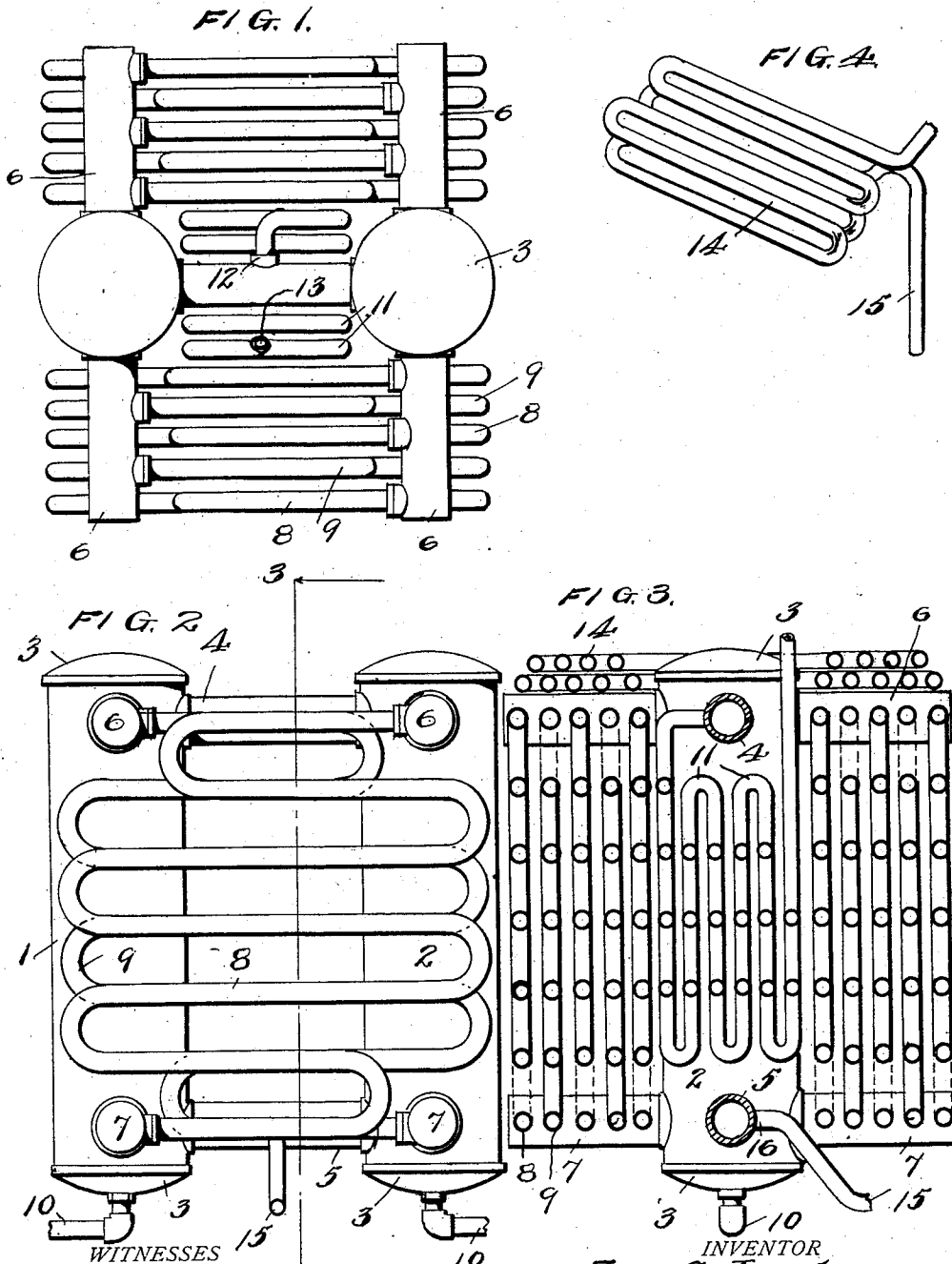


E. C. JACOBSON.
STEAM BOILER.
APPLICATION FILED AUG. 9, 1910.

994,403.

Patented June 6, 1911.



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STEAM-BOILER.

994,403.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ERA C. JACOBSON, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to new and useful improvements in steam boilers of the type wherein the water-tubes or worms are employed in contradistinction to that class of boilers wherein the products of combustion pass through the tubes.

An important object of this invention is to provide a steam generator or boiler of the above character, adapted to be used in connection with automobiles, launches and the like.

A further object of this invention is to provide a steam boiler which is compact, light and capable of generating the maximum amount of steam from the fuel employed.

Other objects and advantages of this invention will appear in the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a plan view of the steam boiler. Fig. 2 is a side view of the same, Fig. 3 is a vertical cross-sectional view taken on line 3—3 of Fig. 2, and Fig. 4 is a perspective view of the pre-heating supply tubes.

In the drawings, wherein is illustrated a preferred embodiment of my invention, the numerals 1 and 2 designate cylindrical shells having their upper and lower ends closed by means of caps 3. These cylindrical shells are preferably vertically disposed and spaced apart as shown. Corresponding upper and lower ends of the shells 1 and 2 are connected by means of horizontal pipes 4 and 5. Each of the cylindrical shells 1 and 2 is provided near its upper and lower ends with diametrically arranged pipe arms 6 and 7. These pipe arms have their outer ends closed as shown, while their inner ends are open to establish communication between said pipe arms and the interior of the cylindrical shell. The pairs of pipe arms 6 and 7 secured to the cylindrical shells 1 and 2 are preferably horizontally disposed, as shown. Disposed

between the upper and lower pipe arms 6 and 7, are alternate steam generating coils 8 and 9. These steam generating coils preferably have their turns disposed in the same vertical plane. The lower end of the coil 8 is suitably connected for communication with the pipe arm 7 of the shell 1 and the upper end of this coil has suitable connection with the upper pipe arm 6 of the shell 2. The alternate coil 9 has its upper end suitably connected with the upper pipe arm 6 of the shell 1 and its lower end suitably connected with the lower pipe arm 7 of the shell 2. The other coils 8 and 9 are connected with the pipe arms 6 and 7 in a like manner. The lower caps 3 of the shells 1 and 2 have suitably connected therewith blow-off pipes 10, which are provided with valves (not shown). The pipes 10 are employed to remove the sediment which may be deposited within the shells 1 and 2.

Disposed between the shells 1 and 2 and the horizontal pipes 4 and 5, is a superheater coil 11, which may be formed of any desired number of turns. One end of this superheater coil is connected with the horizontal pipe 4 as shown at 12 and the opposite end of the same is connected with the engine (not shown) to be driven.

Disposed upon the pipe arms 6 is a pre-heating supply coil 14, one end of which extends downwardly in the form of a pipe section 15 and has communication with the lower horizontal pipe 5 as shown at 16. The opposite end of the coil 14 has suitable communication with a water-tank (not shown.)

In the use of my boiler, heat is applied below the same and circulates between the several coils. The shells 1 and 2 are preferably kept about two-thirds filled with water, supplied to the same through the pre-heating coil 14. It is thus seen that the water is heated before the same enters the shells 1 and 2. The water is fed from the shells 1 and 2 into the pipe arms 7 and from the same into the alternate coils 8 and 9. In these coils 8 and 9 the water is converted into steam and passes through the upper portion of said coils to be discharged into the upper portion of shells 1 and 2. As fast as the water in the coils 8 and 9 is converted into steam, more water is supplied to the same from the shells 1 and 2. The superheater coil 11

receives the steam from the upper portions of the shells 1 and 2 through the pipe 4. The steam within the coil 11 becomes superheated and is conducted to the engine.

5 I wish it understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that certain changes
10 in the size, shape and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having fully described my invention, I claim:—

15 1. In a steam boiler, a plurality of approximately vertically disposed shells, connecting pipes establishing communication between the upper and lower portions of said shells, pairs of oppositely extending
20 pipe arms connected with the upper and lower portions of said shells, steam generating coils having connections with said pairs of pipe arms, and a superheating coil disposed between said shells and steam generating coils, said superheating coil having
25 its end connected with the upper connecting pipe.

2. In a steam boiler, a plurality of substantially vertically disposed shells, connecting pipes establishing communication
30 between the upper and lower portions of said shells, pairs of oppositely extending pipe arms connected with the upper and lower portions of said shells, and arranged at approximately right angles to said connecting pipes, steam generating coils having
35 connections with said pairs of pipe arms, a superheating coil disposed between said shells and having its end extending upwardly for connection with the upper connecting pipe, and a preheating coil disposed
40 upon the upper portion of the boiler and having one end thereof connected with the lower connecting pipe.

3. In a steam boiler, a plurality of substantially vertically disposed spaced shells, connecting pipes establishing communication
45 between the upper and lower ends of said shells, pairs of substantially horizontally disposed and oppositely extending pipe arms connected with the upper and lower portions of said shells, steam generating
50 coils having connections with said pairs of pipe arms and forming a series of coils upon opposite sides of said shells, alternate steam generating coils having connection with the upper pipe arm of one shell and the lower
55 pipe arm of the other shell, a superheating

coil disposed between the shells and series of steam generating coils and between the connecting pipes, and one end of said superheating coil extending upwardly for connection with the upper connecting pipe.

4. In a steam boiler, a plurality of substantially vertically disposed shells, connecting pipes establishing communication between the upper and lower portions of said shells, pairs of oppositely extending pipe arms connected with the upper and lower portions of said shells, and arranged at approximately right angles to said connecting pipes, steam generating coils having connections with said pairs of pipe arms, and a superheating coil disposed between said shells and having its end extending upwardly for connection with the upper connecting pipe.

5. In a steam boiler, spaced approximately vertically disposed shells, upper and lower conduits connecting corresponding portions of said shells, groups of steam generating coils disposed upon opposite sides of said shells, means connecting said steam generating coils with upper and lower portions of said shells, and a superheating coil having connection with the upper conduit.

6. In a steam boiler, spaced approximately vertically disposed shells, upper and lower conduits connecting corresponding portions of said shells, groups of steam generating coils disposed upon opposite sides of said shells, means connecting said steam generating coils with upper and lower portions of said shells, a superheating coil disposed between said shells and having connection with the upper conduit, and a preheating coil disposed upon the upper portions of said shells and having connection with the lower conduit.

7. In a steam boiler, a plurality of shells, upper and lower conduits connecting corresponding portions of said shells, pairs of pipe arms connected with the end portions of each of said shells, steam generating coils disposed upon opposite sides of said shells and having connections with said pipe arms, and a preheating coil disposed upon the upper portion of said boiler and having one end thereof connected with the lower conduit.

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

ERA C. JACOBSON.

Witnesses:

MARY E. SARGENT,
PETER JACOBSON.