

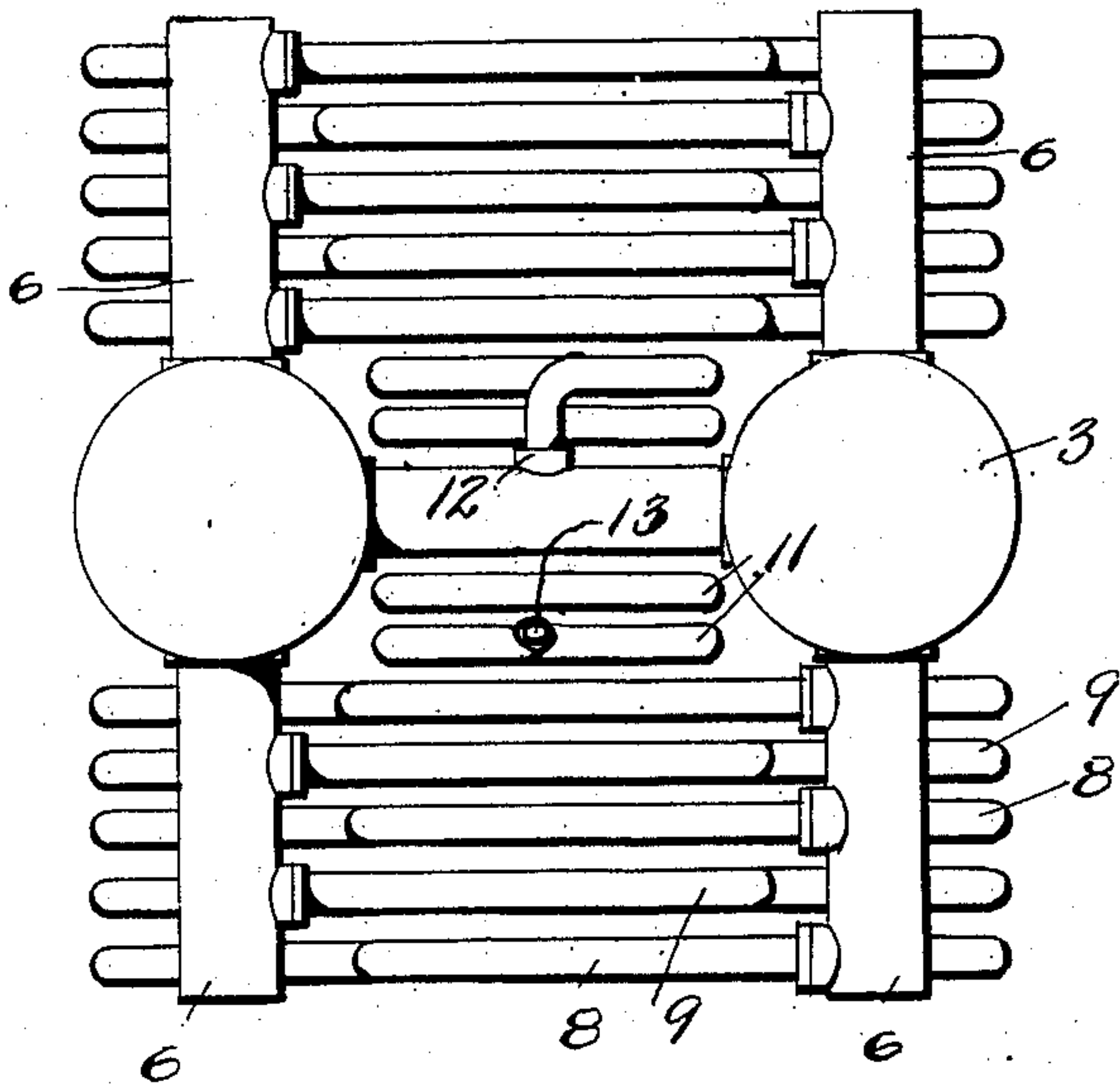
## STEAM BOILER.

APPLICATION FILED AUG. 9, 1910.

**994,403.**

**Patented June 6, 1911.**

**FIG. 1.**



*F/G. A.*

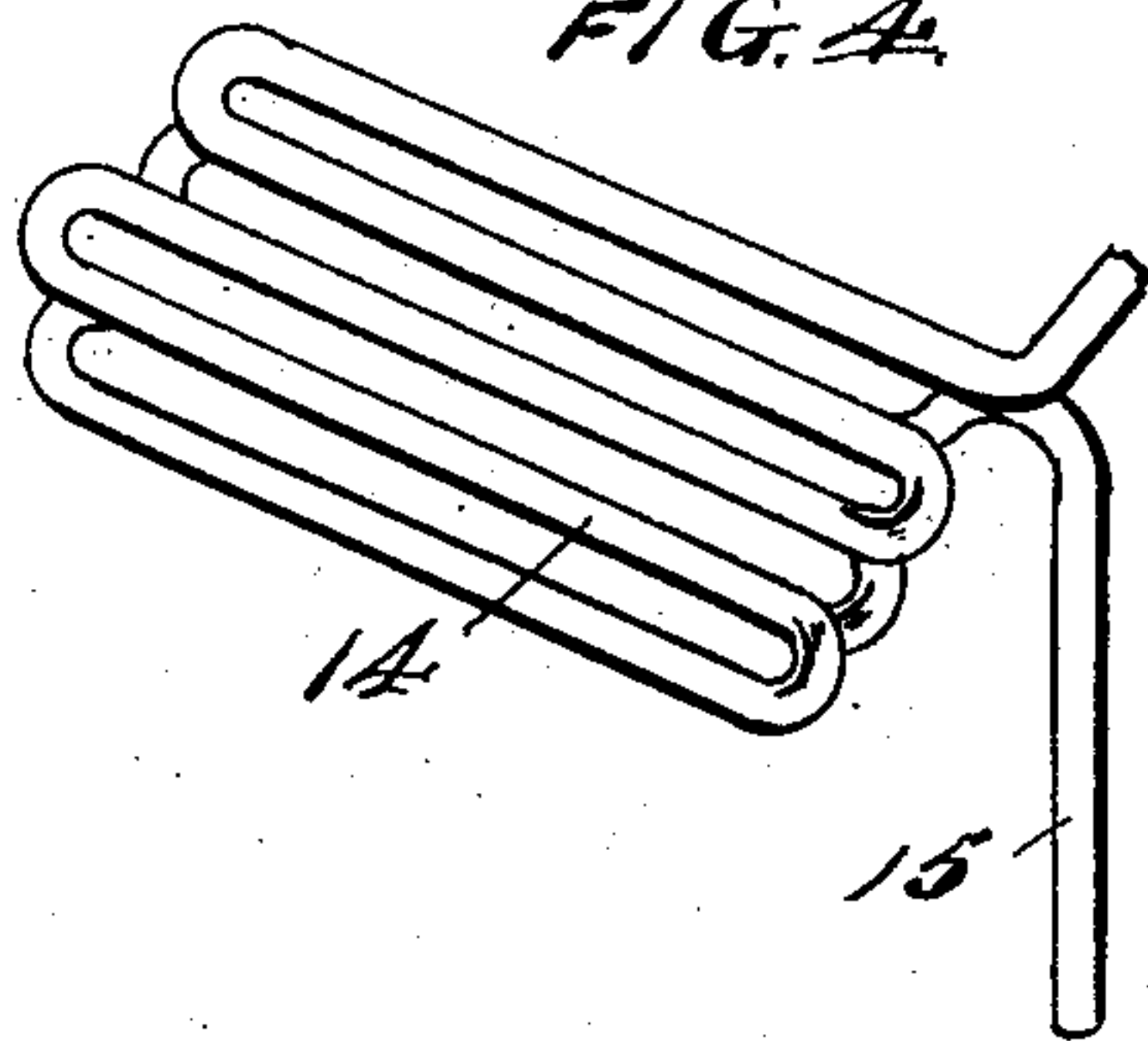
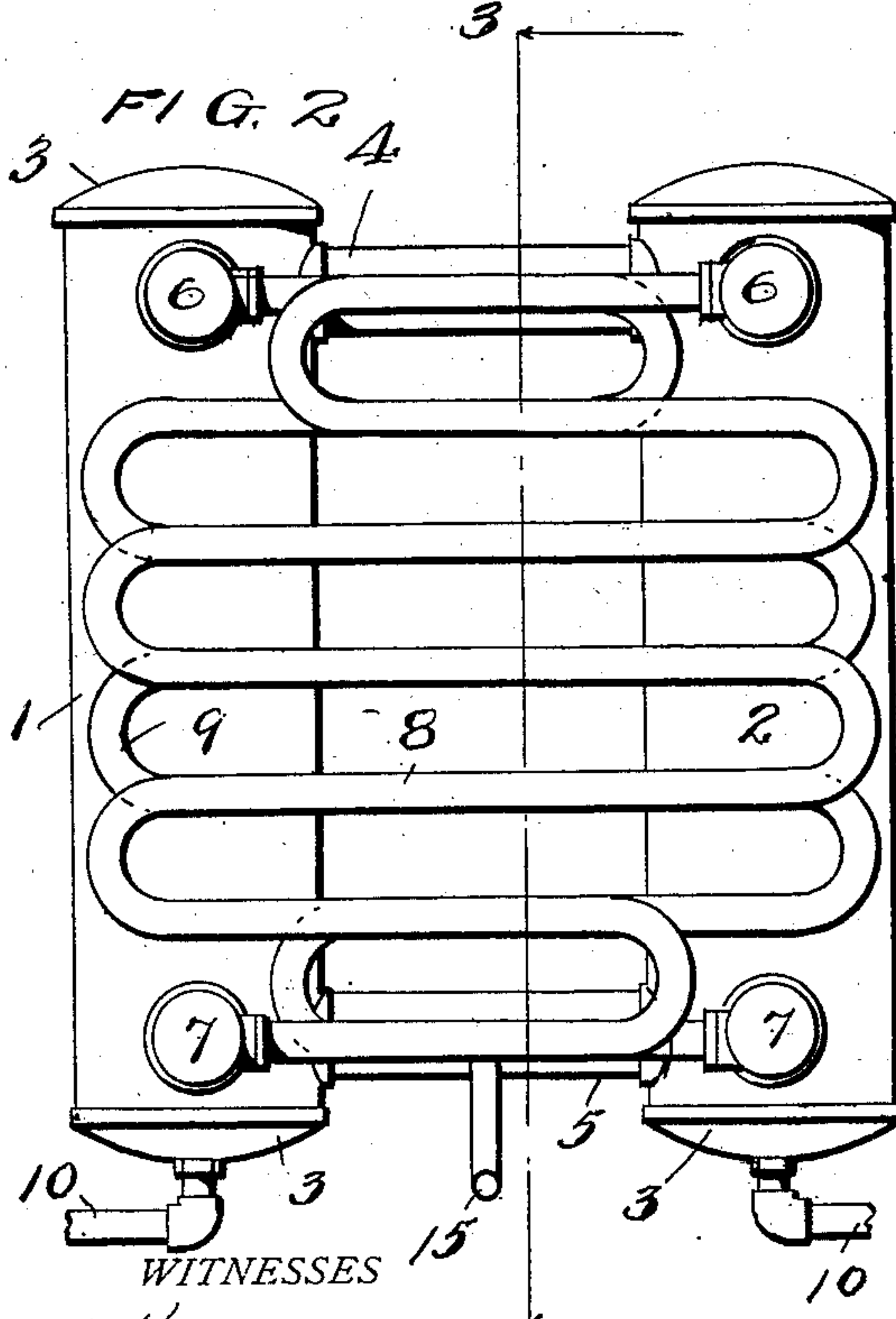


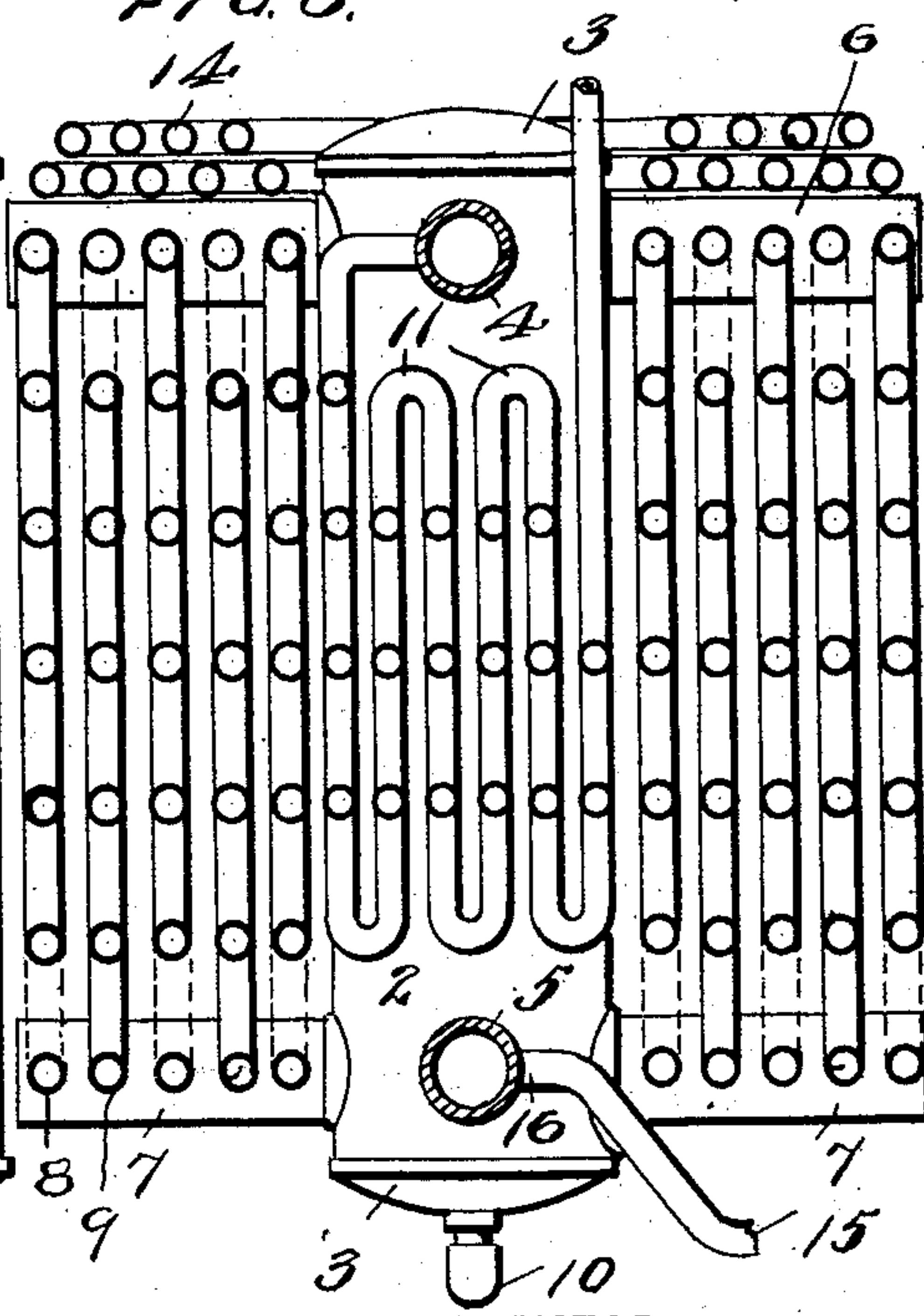
FIG. 2A



*WITNESSES*

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*F/G.3.*



INVENTOR

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# UNITED STATES PATENT OFFICE.

ERA C. JACOBSON, OF LOUISVILLE, KENTUCKY.

STEAM-BOILER.

994,403.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed August 9, 1910. Serial No. 576,308.

*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 in the size, shape and arrangement of parts  
10 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 gen-  
25 erating coils, said superheating coil having its end connected with the upper connecting pipe.

2. 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  
30 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 hav-  
35 ing 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 con-  
40 necting pipe, and a preheating coil disposed upon the upper portion of the boiler and having one end thereof connected with the lower connecting pipe.

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

coil disposed between the shells and series of steam generating coils and between the con- 60  
necting pipes, and one end of said superheating coil extending upwardly for con-  
nection with the upper connecting pipe.

4. In a steam boiler, a plurality of sub- 65  
stantially vertically disposed shells, connect-  
ing pipes establishing communication be-  
tween 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 ap- 70  
proximately right angles to said connecting  
pipes, steam generating coils having con-  
nections with said pairs of pipe arms, and a  
superheating coil disposed between said  
shells and having its end extending up- 75  
wardly for connection with the upper con-  
necting pipe.

5. In a steam boiler, spaced approxi-  
mately vertically disposed shells, upper and  
lower conduits connecting corresponding 80  
portions of said shells, groups of steam gen-  
erating coils disposed upon opposite sides  
of said shells, means connecting said steam  
generating coils with upper and lower por-  
tions of said shells, and a superheating coil 85  
having connection with the upper conduit.

6. In a steam boiler, spaced approxi-  
mately vertically disposed shells, upper and  
lower conduits connecting corresponding 90  
portions of said shells, groups of steam gen-  
erating coils disposed upon opposite sides  
of said shells, means connecting said steam  
generating coils with upper and lower por-  
tions of said shells, a superheating coil dis- 95  
posed between said shells and having con-  
nection with the upper conduit, and a pre-  
heating coil disposed upon the upper por-  
tions of said shells and having connection  
with the lower conduit.

7. In a steam boiler, a plurality of shells, 100  
upper and lower conduits connecting corre-  
sponding 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 105  
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. 110

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

ERA C. JACOBSON.

Witnesses:

MARY E. SARGENT,  
PETER JACOBSON.