

(No Model.)

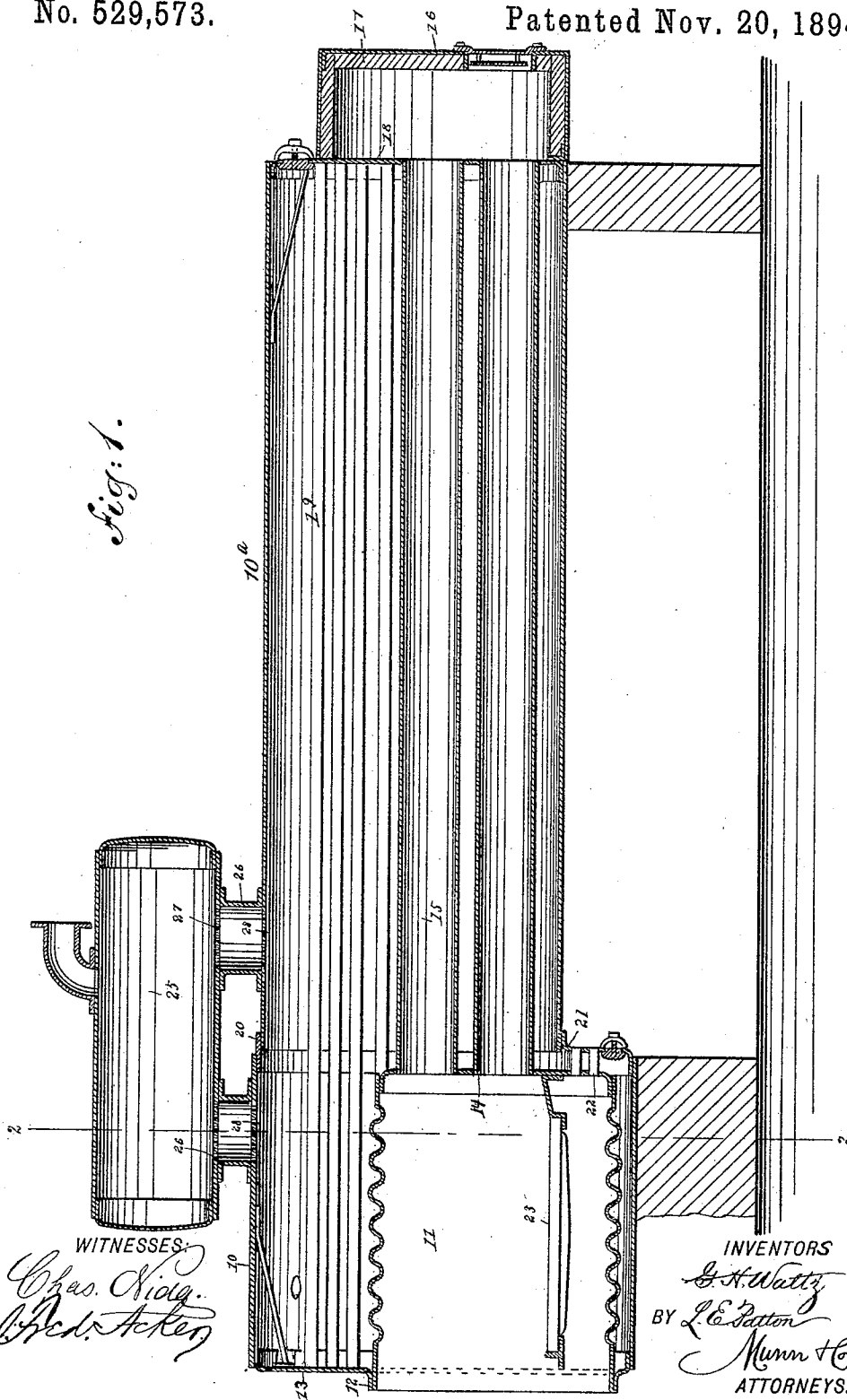
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G. H. WALTZ & L. E. PATTON.
BOILER.

No. 529,573.

Patented Nov. 20, 1894.

Fig. 1.



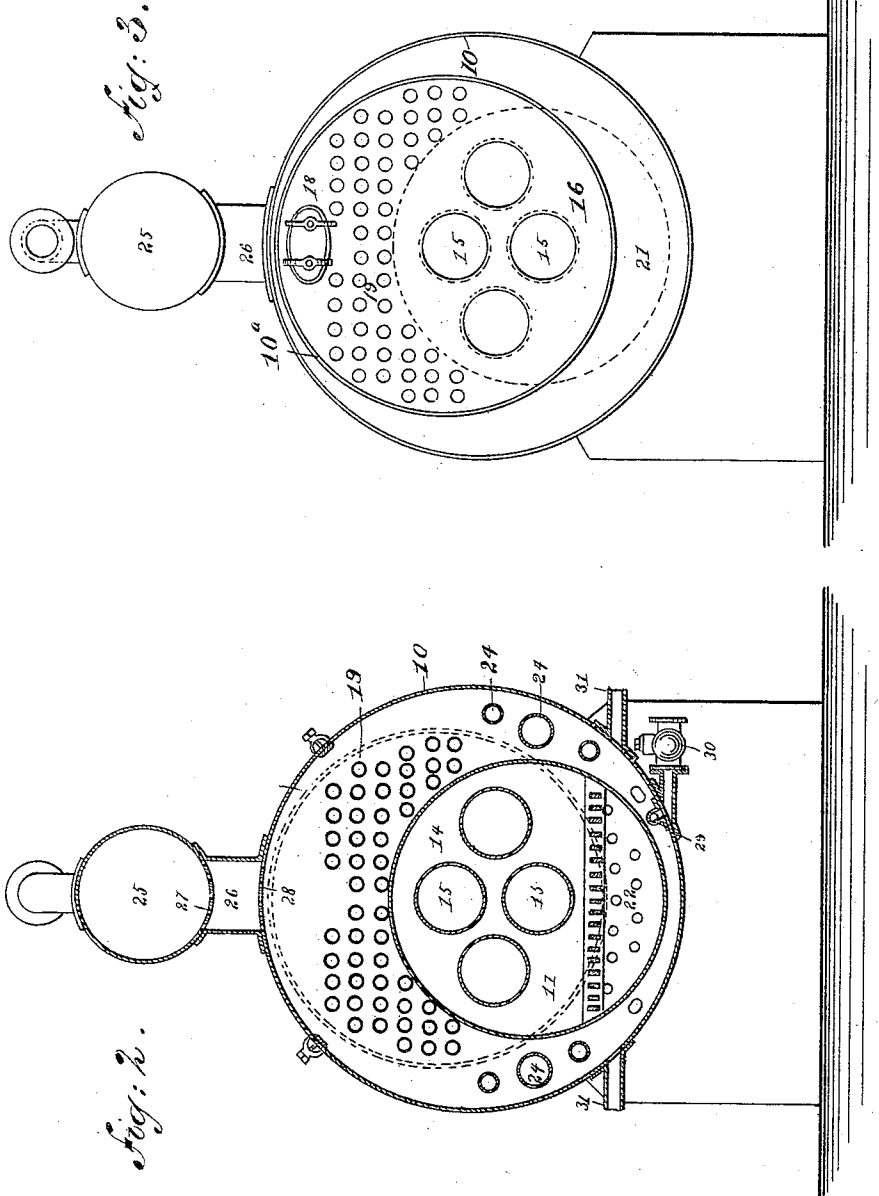
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WITNESSES:

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INVENTORS

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UNITED STATES PATENT OFFICE.

GEORGE H. WALTZ AND LUCIUS E. PATTON, OF MEMPHIS, TENNESSEE.

BOILER.

SPECIFICATION forming part of Letters Patent No. 529,573, dated November 20, 1894.

Application filed July 31, 1894. Serial No. 519,067. (No model.)

To all whom it may concern:

Be it known that we, GEORGE H. WALTZ and LUCIUS E. PATTON, of Memphis, in the county of Shelby and State of Tennessee, have
5 invented a new and useful Improvement in Boilers, of which the following is a full, clear, and exact description.

Our invention relates to an improvement in boilers, and it has for its object to so construct a boiler of this type that the fire box
10 as well as the entire body and barrel of the boiler will be cylindrical, thereby containing no flat surfaces except the heads, and rendering the boiler much safer in use and cheaper
15 in construction than the ordinary patterns of locomotive and marine boilers.

Another object of the invention is to provide for a current of air under the fire, the air passing through hollow stays employed
20 for strengthening the structure.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

25 Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal vertical section through the improved boiler. Fig. 2 is a
30 transverse section, taken essentially on the line 2—2 of Fig. 1; and Fig. 3 is a rear elevation of the boiler, the smoke box being removed.

35 In carrying out the invention the body of the boiler consists of a cylindrical shell 10, forming a front end portion from which extends rearward a cylindrical barrel 10^a of smaller diameter, both being of a size suitable to the power required. The front shell
40 10 contains the furnace or fire box 11, and the said furnace or fire box is also circular, and may be either corrugated or cut with reinforcing rings in the usual manner.

45 The furnace at its outer end is riveted to a collar 12, formed upon the front head 13, which virtually closes the front end of the shell 10, the collar 12 being made to surround a suitable opening through which the shell of
50 the furnace 11 extends, as shown in Fig. 1. The furnace shell is secured to the collar 12 of the forward head by means of bolts, or in

any other approved manner. What may be termed the intermediate head 14, is located in the rear portion of the shell of the furnace, 55 and constitutes the back wall thereof. The intermediate head 14, is provided with four or more thimbles, and in said thimbles the forward ends of four or more large direct flues 15, are introduced, through which the flames 60 of the furnace are conducted to a smoke box 16, located at the rear end of the boiler, the said smoke box being preferably provided with a lining 17 of fire brick, tile, or the equivalent thereof. The smoke box is preferably 65 of less diameter than the barrel 10^a of the boiler, and is eccentrically located thereon. The direct fire tubes 15, at their rear ends, are fitted in ferrules located in the rear head 18 of the boiler.

70 The products of combustion are returned to the front of the boiler from the smoke box through the medium of a number of preferably small return tubes 19, having their rear ends extending through the rear head 18, and the said return tubes 19 extend over the top
75 of the furnace 11 and through the forward head 13 of the boiler, the return products of combustion escaping from the tubes 19 into a suitable stack through a bridging which is 80 placed on the front end of the boiler.

The larger cylindrical shell 10 forming the front portion of the boiler, and the cylindrical shell 10^a constituting the rear of the boiler, are directly connected by means of a throat 85 20, which throat is enlarged or widened at suitable points to form a wall 21, extending from the exterior of the barrel of the boiler to a connection with the forward shell section 10 at the rear thereof, thus closing any space 90 that might exist through a discrepancy between the size of the shell and the barrel. The said throat 20, is also connected in any suitable or approved manner to the inner head 14, or inner end of the furnace. The 95 said connection, however, is preferably made through the medium of hollow stay bolts 22, as shown in Fig. 1, whereby air is supplied from the surrounding atmosphere below the grate 23 of the furnace, which may be supported in any approved manner; and the said hollow stays supply air immediately in front
100 of the inflamed gases passing from the furnace into the direct tubes 15.

In the wide water spans on the sides of the furnace, in the shell 10 or front of the boiler, a number of tubes 24 are inserted, the said tubes being preferably of different diameters, the tubes being expanded in holes made to receive them in the front and throat 20, and these tubes are capped so as to exclude cold air, their object being to take up the surplus water space and act as stays from the front head to the throat 20, connecting the front and rear cylinders.

The boiler is provided with a steam drum 25 and the usual feed and check valves and the blow off valves. The steam dome is connected with the steam space in the boiler through the medium of hollow standards 26, and the bottom portion of the dome surrounded by the said standards is provided with a sieve or screen surface 27, and is likewise that portion of the boiler casing supporting the standards, the latter sieves being designated as 28 and both sieves being shown in Fig. 1, the object of these sieves or screens being to prevent moist steam entering the dome 25, and insuring said dome being filled with dry steam.

Perforated pipes 29, are connected with the blow-off valves, and are located within the front cylinder or shell of the boiler below the furnace, the said pipes lying close to the bottom of the shell as shown in Fig. 2. The object of these pipes is to take up and remove the sediment from the full length of its bottom when the blow-off valves 30 are opened. As the front and rear cylinders of the boiler are directly connected, it is presumed the blow-off on the front cylinder will be sufficient, but if desired a similar one may be placed anywhere along the bottom of the barrel, extending to the rear.

The front and rear heads of the boiler above the tubes are stayed to the shell in the ordinary manner by crow-foot brace rods, or by full length rods. The furnace, fire tubes and flues are entirely submerged beneath the water of the boiler. It is designed to feed the boiler by two feed connections 31, located at the larger or front shell just below the line of grates within the furnace, thus insuring a positive circulation of the water within the boiler.

A boiler constructed as above set forth presents no crown sheets upon which sediment may collect. It is stronger than ordinary boilers, and its steam capacity for its size is far greater than that of the usual locomotive or marine boiler. It will be understood that in one shell 10 any desired number of furnaces 11 may be located.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a boiler a forward shell, circular fire boxes or furnaces located therein, a cylindrical barrel constituting the rear of the boiler and connected with said shell, a smoke box located at the rear of the barrel exterior thereto and having a firebrick lining, fire tubes leading from the fire boxes or furnaces in the smoke box, and return tubes leading from the smoke box to the front of the boiler over the fire boxes or furnaces, as and for the purpose specified.

2. In a boiler, a body, the same consisting of a forward cylindrical shell, a barrel of smaller diameter projected rearward from the shell, a cylindrical fire box or furnace located within the shell, a throat connecting the shell and barrel and closing the space between their outer and contiguous surfaces, and tubular stay bolts extending through the throat into the rear wall of the fire box or furnace below the rear end of the grate, the said bolts serving as supports and likewise for the introduction of air to the fire, as and for the purpose specified.

3. In the construction of a boiler, a shell, a barrel of smaller diameter projected rearward from the shell, connected with a tubular furnace located within the shell, direct fire tubes leading from the said furnace into the barrel, the barrel being provided with return flues, and tubular braces located in the water spans between the shell and furnace, taking up the surplus water space and serving as stays for the boiler, substantially as shown and described.

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