

(No Model.)

L. B. BATTIN.

STEAM BOILER.

No. 381,822.

Patented Apr. 24, 1888.

Fig. 2.

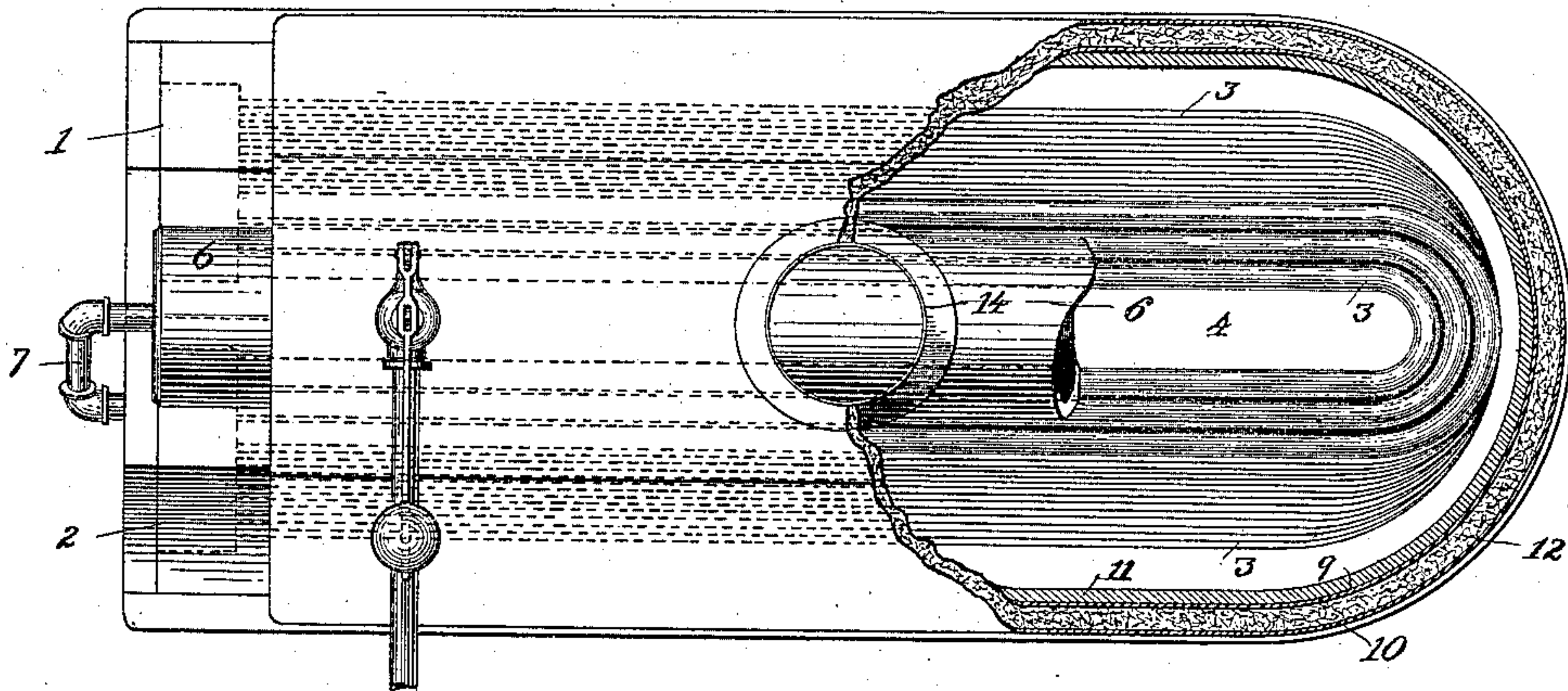
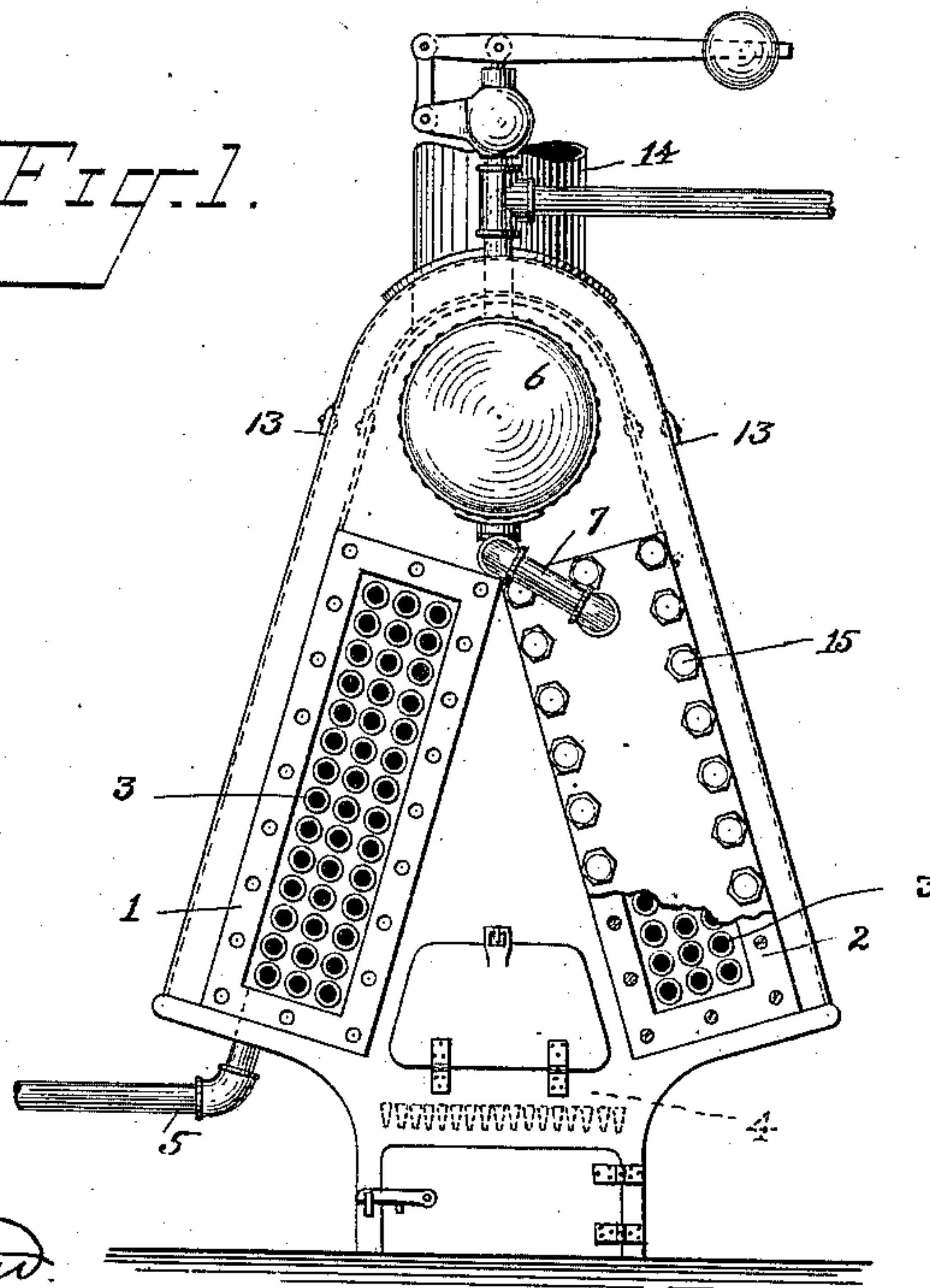


Fig. 1.



WITNESSES:

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STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 381,822, dated April 24, 1888.

Application filed November 15, 1887. Serial No. 255,254. (No model.)

To all whom it may concern:

Be it known that I, LAMBERT B. BATTIN, a citizen of the United States, residing at Elizabeth, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a full, clear, and exact specification.

The object of my invention is to decrease the number of joints heretofore necessary in the construction of steam-generators and to obviate the necessity of exposing such joints as are employed to the direct action of the products of combustion from the fire-box, which, as it is well known, produce exceedingly detrimental effects upon such joints and thereby cause leakage from the boiler.

The other important object of my invention is to construct a water-tube steam-generator whose interior is as easily accessible as the exterior, and in the invention, hereinafter described, it will be seen that the interior of one-half of the tubes can be easily reached by simply removing one of the header covers, which facilitates the cleaning of the boiler and making any necessary repairs.

My invention consists of a novel arrangement of boxes into which the ends of the boiler-tubes are expanded, which boxes will be hereinafter termed the "headers." Each of these headers is provided with a removable cover, and is long in comparison with its width, so as to enable a great assembly of tubes to open thereinto, and at the same time avoid the danger arising from too great a cross-section being subjected to the steam-pressure.

My invention also consists of certain features of novelty hereinafter described.

In the present form of my invention, I prefer to employ two of the aforesaid headers and bend the boiler-tubes into U form and connect the two ends of each tube with the respective headers; but my invention and the details of construction will be better understood from a description thereof with reference to the accompanying drawings, which I will now give, and in which drawings—

Figure 1 is a front view of the preferred form of my steam-generator, showing the furnace. Fig. 2 is a plan view of the same, portions being removed and portions being broken away.

As shown in the drawings, I preferably arrange the two boxes or headers 1 2 with their upper ends together and their lower ends diverged or separated, and consequently the U-shaped boiler-tubes 3 will assume in cross-section the form of a truncated pyramid. The object of this arrangement of the headers is to make the apparatus more compact and bring the bulk of the weight nearer to the base or the floor by enabling the fire-box 4 to be placed between the bottom tubes, and while the upper ends of the boxes being convergent brings the tubes therein directly over the center of the fire-box or in the current of the products of combustion, it also reduces the superfluous bulk of the furnace or fire-box, and hence this form is most applicable to marine purposes. This particular construction is not necessary, however, and may be modified for stationary or land boilers.

The headers 1 2 are provided with removable covers, as before mentioned, which are retained in position by means of screw-bolts 15, and which when removed reveal the ends of the boiler-tubes, which greatly facilitates in the cleansing of the latter, and these two headers, with the tubes connecting them and extending through and across the combustion-chamber, practically constitute my boiler. The feed-water enters the header 1 through the pipe 5, then enters the tubes, and passes through the combustion-chamber, and, together with the steam generated from such passage, collects in the opposite header, 2, from whence it enters the steam-dome 6 via the pipe 7, thus causing a positive circulation through the boiler. This steam-dome is preferably as long as the boiler-tubes, and is practically located within the combustion-chamber, supported at each end by the end walls of the latter, through which it projects just above the boiler-tubes, so that it will be fully exposed to the products of combustion, whereby the steam therein will be dry.

The case of the combustion-chamber is preferably composed of two parts, 9 10, of sheet metal. The surface of the inner one, next to the fire, may be lined with any suitable fire brick or clay, 11; but the intermediate space between the two is filled with asbestos, 12, or other suitable non-conducting material, which, being non-combustible and a non-conductor of heat, confines the heat to the combustion-

chamber, and at the same time forms a light and effective wall. The crown of the furnace may be formed in a similar manner, and it is provided with eaves or flanges 13, which rest
5 upon the upper edges of the case, as shown, and thus hold it in place. This crown completely incases the dome, with the exception of a small portion at each end, and leaves only sufficient space between it and the former for
10 a free draft and the passage of the products of combustion, which exit *via* the stack 14 planted in said crown.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

The combination of the headers 1 2, arranged in a vertical plane with their lower ends divergent, the U-shaped boiler-tubes having their ends expanded in said headers respectively, whereby said tubes form converging walls, a fire box between the walls thus formed, and an inlet at the bottom of one and an outlet at the top of the other of said headers, substantially as set forth.

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Witnesses:

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