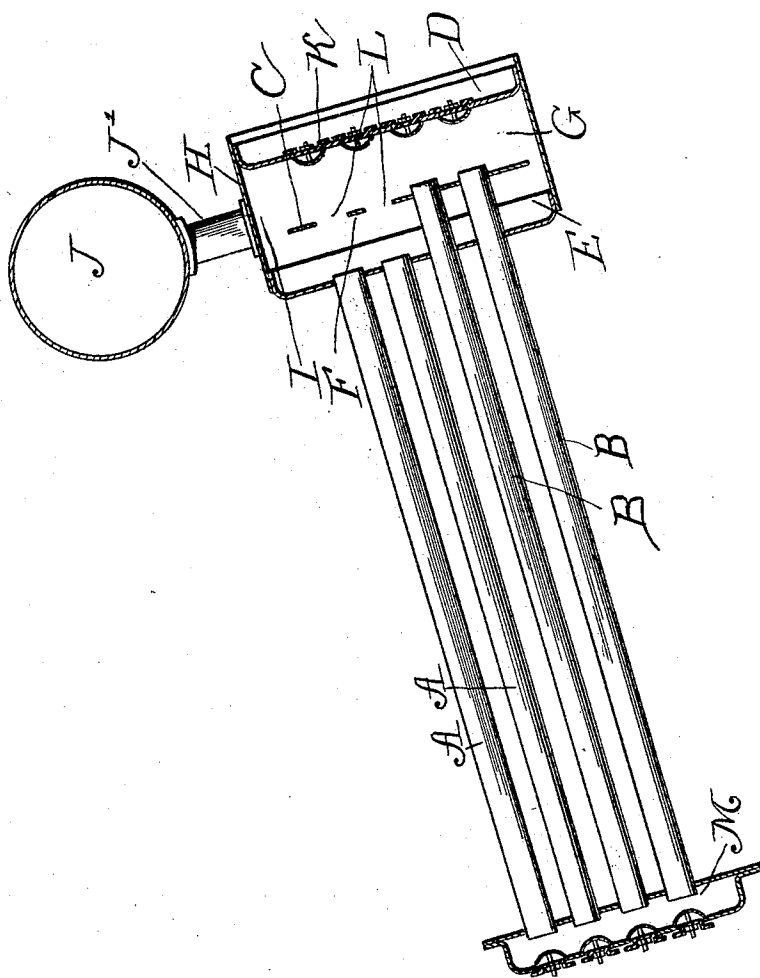


(No Model.)

M. H. C. SHANN.
WATER TUBE STEAM BOILER.

No. 517,174.

Patented Mar. 27, 1894.



Attest
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Atty. S.

UNITED STATES PATENT OFFICE.

MONTAGUE H. C. SHANN, OF MENDIP HILLS, VICTORIA.

WATER-TUBE STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 517,174, dated March 27, 1894.

Application filed June 14, 1893. Serial No. 477,608. (No model.)

To all whom it may concern:

Be it known that I, MONTAGUE H. C. SHANN, a subject of the Queen of Great Britain and Ireland, residing at Mendip Hills, Preston, in the Colony of Victoria, have invented a certain new and useful Improvement in Water-Tube Steam-Boilers, of which the following is a specification.

My present object is to provide an improvement in water tube steam boilers whereby they will be less expensive to manufacture and quicker to steam than other boilers of a similar character.

The class of boilers to which the herein-described improvement is applicable consists of rows of parallel inclined steel tubes surrounded with a wrought iron or steel casing or shell provided with an exit flue.

The principle of my improvement consists in terminating the front ends of the upper rows of tubes so as to communicate with one water chamber and the front ends of the lower rows with another water chamber whereby the hottest water is circulated from that part of the boiler which is subjected to the hottest furnace gases, to the coldest part, or in other words, the water which flows up the lower rows of tubes may supply the current flowing down the upper rows.

In the drawing, the figure is a longitudinal section of the boiler.

In the figure, (A) and (A) represent the upper rows of tubes and (B) and (B) the lower rows; they are all set at an inclination and parallel with one another, the front ends being higher than the rear ends.

(C) is a vertical diaphragm plate fixed centrally between the front and back plates (D) and (E) to form the two water chambers (F) and (G). Between the top of said diaphragm plate (C) and the crown (H) of the chambers (F) and (G) a passage (I) is provided so that the steam may pass from said chambers to the drum hereinafter described. It will be seen that the upper rows of tubes terminate at said back plate (E) and the lower rows (B) and (B) with the diaphragm plate (C), which terminations are effected by making said upper rows

of tubes (A) and (A) shorter than the lower rows (B) and (B). The front plate (D) of the boiler has formed therein the same number of hand holes as there are water tubes, and each hole is provided with a cover similar to (K) to permit of the inspection of, or repairs to the tubes. The holes aforesaid formed in the front plate (D) correspond with holes similar to (L) provided in the upper part of the diaphragm plate (C) for the circulation of the water from the chamber (G) to chamber (F), and also for the inspection of the upper rows of tubes (A) (A).

(M) represents a junction box situated at the rear or lower ends of all the tubes to permit of the circulation of the water from the lower rows of tubes (B) (B) to the upper ones (A) (A).

(J) is the aforesaid drum connected with the crown (H) by means of the pipe (J') to communicate with the two before-mentioned water chambers (F) and (G) so as to secure for use the dry steam. Said drum is fitted in the customary manner with safety valve gear and also a steam pipe and a pressure gage. A casing (not shown) is constructed so as to surround the tubes and also form the outer shell of the furnace, the inner surface of which is suitably lined with ordinary fire bricks.

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

In a water tube steam boiler, two water chambers with a perforated diaphragm between them, two sets of inclined tubes the upper set connecting with the first chamber and the lower set passing through the first chamber to the second, a series of hand holes K, hand holes L in the diaphragm leading to the upper tubes, a steam space I between the chambers, a steam drum J and a passage J' leading thereto, substantially as described.

In witness whereof I have hereunto set my hand.

MONTAGUE H. C. SHANN.

Witnesses:

R. E. CHURCHILL SHANN,
ALBERT E. B. SWANSON.