

A. B. Latta,

Steam-Boiler Water-Tube.

No 23.589.

Patented Apr. 12, 1859.

Fig. 2.

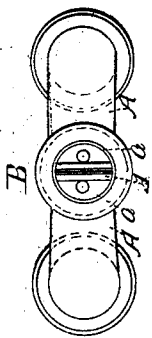


Fig. 1.

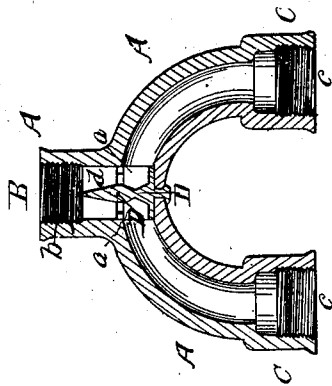
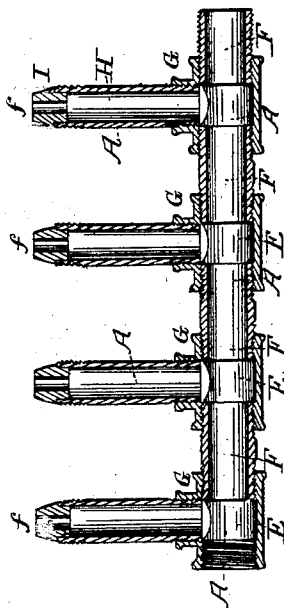


Fig. 3.



UNITED STATES PATENT OFFICE.

A. B. LATTA, OF CINCINNATI, OHIO.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 23,589, dated April 12, 1859.

To all whom it may concern:

Be it known that I, A. B. LATTA, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 represents a longitudinal section of an improved dividing-piece constructed on my plan suitable for the division and distribution of the water into two coils; Fig. 2, an end view of the same, and Fig. 3 a longitudinal section of a modification of the dividing-piece suitable for distributing the water into a series of division-coils.

My present improvement relates more particularly to coiled boilers. In this class it is an object of paramount importance to maintain a full and continuous supply of water through all the coils, as were some of them not to receive the requisite supply they would be liable to be burned where the coils are subjected to the direct action of the fire. Moreover, as the coils would thus be exposed to be overheated, such a sudden and rapid generation of steam might ensue were the water then to come in contact with their surface when heated to a high red heat as to cause dangerous explosions. The reason that it is so difficult to maintain a regular circulation through all the coils is to be ascribed in a great measure to the fact that very often the heat in the fire-box is not uniform throughout. Hence where the fire is more brisk around a coil a greater amount of caloric will be imparted to the water and the steam more rapidly generated in it than in a coil around which there is less fire. It would therefore be necessary, in order that the full supply be maintained, that the water should circulate more rapidly through that coil; but instead of such in practice being the case in coiled boilers as heretofore constructed it will be found that on the contrary the circulation will be retarded, as the greater pressure or tension in that coil caused by the more rapid generation of steam will present a considerable additional resistance to the progress of the water. To remedy these defects and to insure a continuous and equable distribution of the water is the object of my invention;

and it consists in regulating the supply of water to the various coils by means of a main or mains provided with one or more dividing-pipes (corresponding in number to the number of coils to be supplied and to the kind of dividing-pipes to be used) the outlets of which leading into the coils are so reduced that their aggregate sectional area shall not exceed, but on the contrary should, if anything, be considerably less, than the sectional area of the main or supply pipe, whereby the water will not only, where they are of equal area, be much more uniformly and equally distributed between them than by the old method, but will, where their aggregate area is less, be forced into the various coils with such force as to compensate for any additional resistance that may arise from a more rapid generation of steam in any of the various coils; to which end the sectional area of the coils is made of a size larger than the outlets of the dividing-pipes so as to compensate for the expansion of the water as it is heated.

In the accompanying drawings, Figs. 1 and 2 represent a dividing-piece intended to be used for the distribution of the water from the main coil into two branch coils. It consists of a curved cast-iron pipe A, provided in the middle with a mouth-piece B for the reception of the end of the main coil or pipe, on the latter of which is cut a male screw which takes into a female screw-thread *b*, cut in the end of the mouth B of the dividing-piece. The ends C and C of this curved pipe are somewhat widened, and also provided with a screw-thread *c* for the reception of the male screw formed on the ends of the division-coils. Through the middle of the curved pipe A, directly opposite the center of the mouth-piece B and leading into it, is fitted securely a partition D, which divides the pipe into two branches, forming, as it were, two outlets both of which in this instance are so much reduced in area as to present only two small holes *a* and *a*, one for each branch. The separating piece or partition D is represented as being provided at its outer end with a long and sharp dividing-point *d*, which extends sufficiently far into the piece to serve the purpose of separating or dividing the water in two currents of equal bulk as it flows into the dividing-piece A from the main coil

or pipe, whence it (the water) is forced through the openings *a* and *a* into the two branches of the dividing-piece and thence into the division-coils. By this arrangement as the water from the main coil is forced into the division-coils through reduced outlets or openings, the aggregate of the sectional area of which is less than that of the main coil, it (the water) will be more uniformly divided between the different branch coils, and it will rush in with so much greater force or velocity as to effectually counterbalance the greater pressure or resistance in such coils where steam is more rapidly generated, and thus maintain in them a more regular circulation of water. The capacity of these coils is made of a size greater than the area of the outlets, so as to compensate for the expansion of the water as it is heated in them.

Fig. 3 represents a modification of a dividing-piece suitable for separating the water of the main into a series of division-coils. It consists of a number of branch pipes *E*, corresponding in number to the number of division-coils used in the boiler, and which are united together by means of short connecting-pipes *F*, the branch pipes being for this purpose provided with a screw-thread at

either end into which the ends of the connecting-pipes are to be secured. The mouth-piece *G* of the branch pipes has a screw-thread cut on its inner side, into which is screwed the end of a conducting-pipe *H*, the other end of which is screwed into the termination of a division-coil. At the end of this pipe is tightly fitted or formed a metallic block or stopper *I*, which has a small hole or opening *F* running through its middle, through which the water is to be forced into the division-coil, care being taken that the area of the main coil shall equal, and if anything exceed, the united sectional area of the openings *f*.

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

The method of regulating the circulation of water through the division-coils by means of a dividing-piece *A*, constructed in the manner and for the purposes substantially as set forth.

In testimony whereof I hereunto set my hand to this specification.

A. B. LATTA.

Witnesses:

M. BENSON,
B. J. HORTON.