H. BAILEY.

Fire-Tubes for Steam-Boilers.

No. 166,180. Patented Aug. 3, 1875.

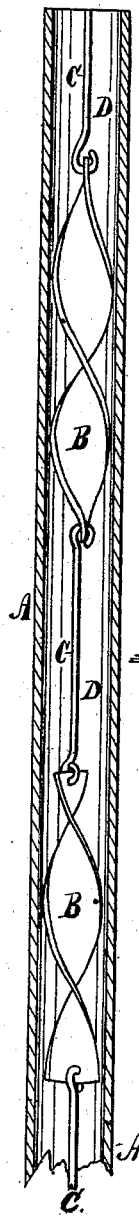

Fig. 1.

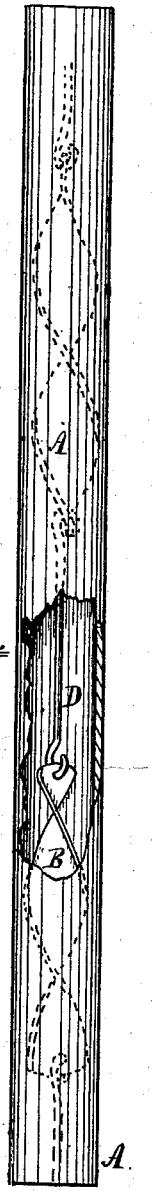

Fig. 2.

Witnesses:

A. De Bevoise

John C. Hoyt

Inventor:

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by his attorney Horatio R. Taft

UNITED STATES PATENT OFFICE.

HENRY BAILEY, OF NEW YORK, N. Y.

IMPROVEMENT IN FIRE-TUBES FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **166,180**, dated August 3, 1875; application filed July 1, 1875.

To all whom it may concern:

Be it known that I, HENRY BAILEY, of the city, county, and State of New York, have invented a new and useful Improvement in the Fire-Tubes of Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings forming part of this specification.

The object of this invention is to render steam-boilers of the tubular class more effective in generating steam than they have heretofore been; and it consists of a series of metallic spiral sections connected together, having spaces (one or more) between the sections, which spaces serve as combustion-chambers. It also consists in the connecting link or rod, in combination with the spiral sections and combustion-chamber.

In the accompanying drawings, Figure 1 represents a longitudinal section of the improved boiler-tube. Fig. 2 is an outside view of the same, showing the tube broken away, and the spiral in dotted lines.

A is the tube. B is the metallic spiral. C is the connection of the spiral sections. D is the space or combustion-chamber between the spiral sections. In the generation of steam in ordinary tubular boilers the heated gases and flame pass through the tubes unobstructed, and carry off a large percentage of the heat, which is wasted. In order to utilize the whole of the heat, or nearly so, it is necessary to not only retard the current, but to throw it from the center to the surface of the tube, and to have one or more combustion chambers or spaces between spiral sections. The spiral sections are formed of strips of thin metal, which are twisted or made spiral in any manner, so that when placed in the tube the heated gases and flame will pass readily and be thrown by the spiral from the center of the tube and to the surface, and be retained in the tube a much longer space of time than they otherwise would. Between the spiral sections are the spaces D, which serve as combustion-chambers for the more perfect consumption of the gases as they pass through the tube. The spiral sections are connected together by the links or rods C, so that the whole is flexible or chain-like. This flexibility is an important feature, as the spiral sections can be placed in tubes where the boilers are in use, and when the fire box front would form an obstruction if the spiral was not made in sections and thus connected together. The spiral sections are nearly the diameter of the interior of the tube, and the length of the combustion-chamber D may be one foot, more or less. The spiral will, of course, vary in size according to the diameter of the tubes.

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

1. In combination with the spiral sections B, the combustion-chamber D, for the purposes described.

2. The connecting link or rod C, in combination with the spiral sections B, for the purposes described.

HENRY BAILEY.

Witnesses:

A. DE BEVOISE,

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