No. 75,279. PATENTED MAR. 10, 1868.

P. M. KAFER.

TUBE FOR STEAM GENERATORS.

Fig. 1.

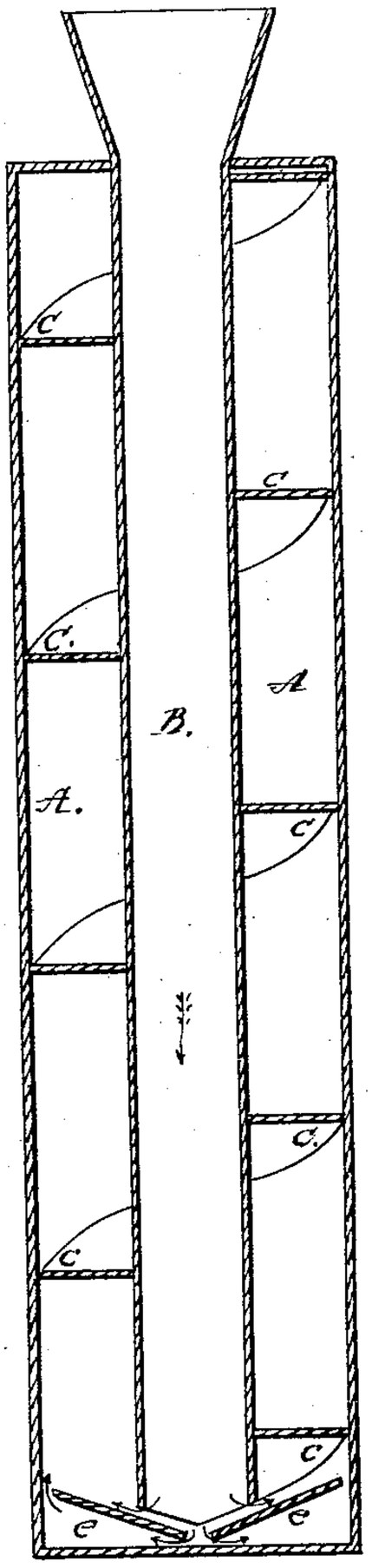
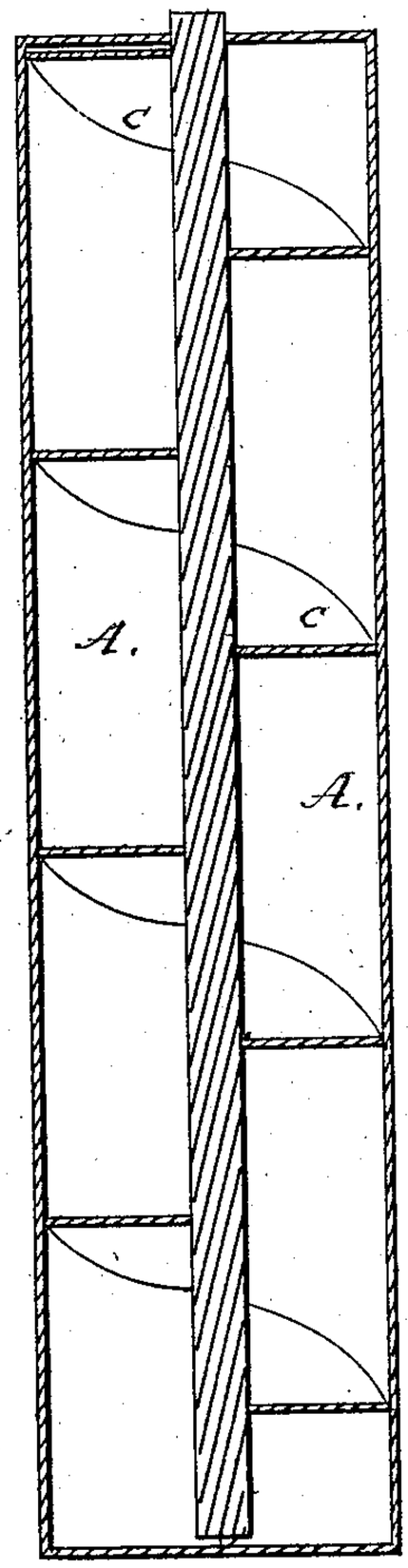


Fig. 2.



attest.
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PETER M. KAFER, OF TRENTON, NEW JERSEY.

Letters Patent No. 75,279, *dated March* 10, 1868.

IMPROVEMENT IN TUBES OF STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, PETER M. KAFER, of Trenton, New Jersey, have invented new and useful Improvements in Heating-Tubes for Boilers; and I do hereby declare the following to be a full and exact description of the same, reference being had to the drawings that accompany and form a part of these specifications, in which—

Figure 1 is a vertical bisection of one style of my improved tubes.

Figure 2, sectional view of one slightly different from the first.

Letter A, a tube, closed at the bottom; letter B, another tube, open at both ends, and of diameter much less than that of A, in which this latter is placed; letter C, a strip, of width equal to the space between the inside of A and the outside of B. This strip is arranged spirally between A and B, as the drawings illustrate.

In the tube A, at the end of tube B, I place a conical or V-shaped piece, shown at *e* in fig. 1. This has a small opening in the centre, so as to allow a portion of the water to pass between it and the end of the tube A. This V-shaped piece serves to turn the current of the water up to be conducted by the spiral, C, back through tube A.

The object of my invention is to make and produce, for the public, tubes for fire and other engines that will secure more uniformity of heat, and be less liable to warp or suffer misplacement than those heretofore in use.

Generally in engines, the heat cannot be uniformly applied. One side of the tubes will be more heated than the other, and thus be less effectual in its purpose, and, what is often worse, be warped or strained from its normal position. Many engines from these causes call for repairs almost at the very commencement of their use. The adoption of my plan obviates all this.

When heat is applied, and the water begins to ascend, it is, by the spiral, C, carried around and upwards, coming in contact with all sides, both of the tube A and the tube B. Now, however rapidly the fire is kindled and the heat accumulates, a disproportionate heating of any parts will not take place.

I am aware that oblique or spiral fins or projections have been introduced into vertical or inclined water-tubes of steam-boilers for the purpose of producing rotative motion in the contents thereof, and that the guides or fins so placed have been made of varying pitch. These, therefore, I distinctly disclaim; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The continuous spiral guide, of uniform pitch, forming a continuous channel in vertical or inclined water-tubes of steam-boilers, substantially as set forth and described.

2. The V-shaped piece *e*, substantially as described and for the purposes set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

PETER M. KAFER.

Witnesses:

CHARLES H. W. HUDNET,

CHARLES MOHRFELD.