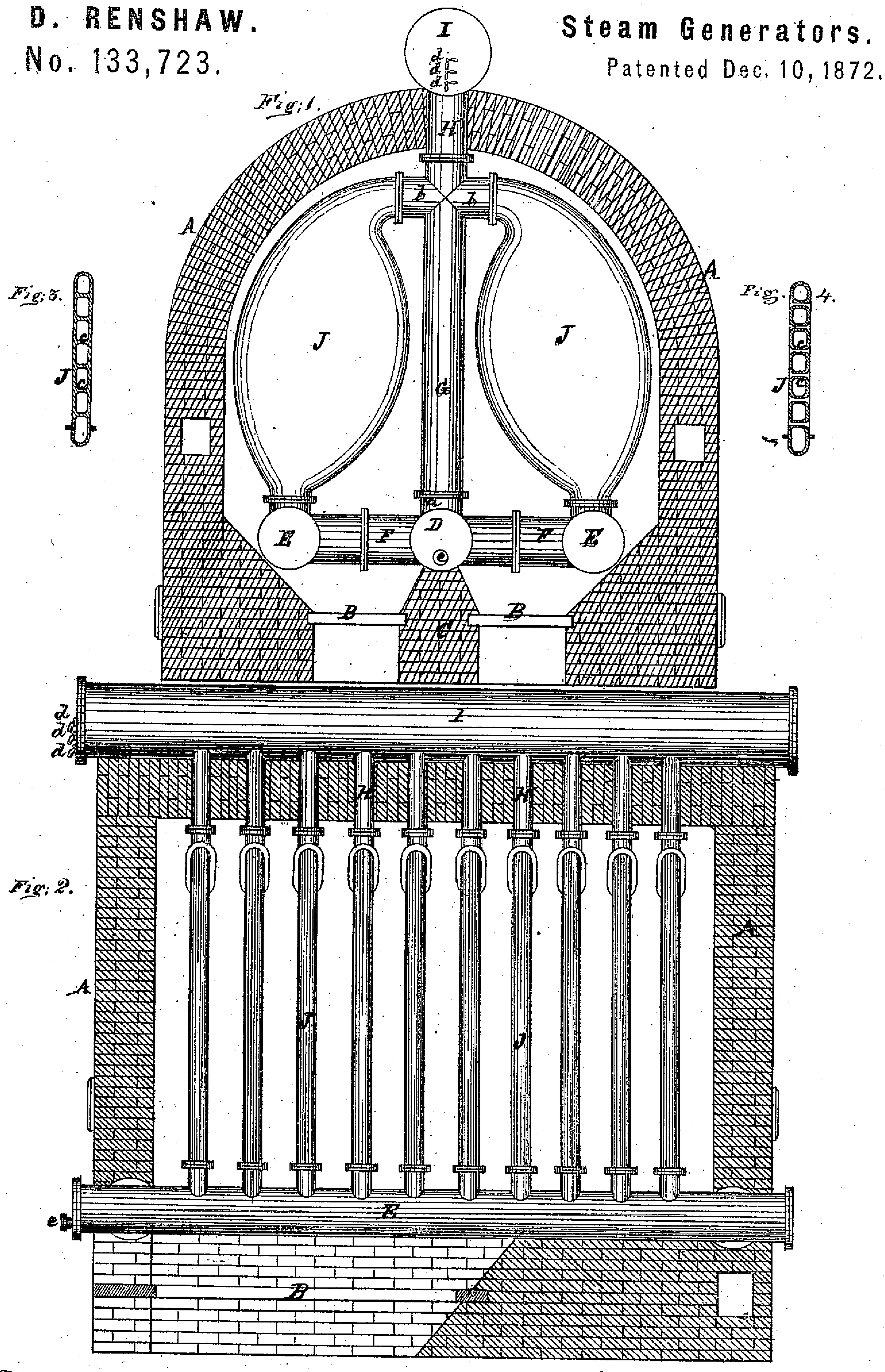
D. RENSHAW.

No. 133,723.

Steam Generators.

Patented Dec. 10, 1872.



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UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **133,723**, dated December 10, 1872.

To all whom it may concern:

Be it known that I, DAVID RENSHAW, of Syracuse, in the county of Onondaga and State of New York, have invented certain Improvements in Steam-Generators, of which the following is a specification:

Nature and Object of the Invention.

This invention relates to the construction of the parts exposed to the direct action of the heat in generating steam and their combination with other parts, and their arrangements with relation thereto; and is designed to furnish a more compact steam-generator, and one in many respects more serviceable than any heretofore in use.

Description of the Accompanying Drawing.

Figure 1 is a front elevation of the steam-generating apparatus and the section of the reverberatory-furnace with which these parts are to be combined, and inside of which they are to be arranged. Fig. 2 is a longitudinal view in similar elevation and section. Fig. 3 is a detail view, showing in horizontal section one of the modes in which I propose to construct the flat cast-metal sections which constitute the principal, or at least large, part of the steam-generating portion of my improved generator. Fig. 4 is a similar section, showing another mode of construction.

General Description.

A is a reverberatory-furnace, which is here represented as being made of brick and provided with two fire-grates, B B, with a bridge, C, between them to support the steam-generating parts. The furnace, however, may be constructed, in most respects, substantially as described in the Letters Patent granted to me February 20, 1872, only changing it in such particulars as may be necessary to adapt it to the construction of the boiler which is hereinafter described, and especially to furnish a central support for the boiler. D is a central cylinder extending the whole length of the furnace and connected at or near its ends to the cylinders E E by the cross-cylinders F F. The central cylinder D is provided with upwardly-projecting connections *a a* to receive the central vertical pipes G G, which latter connect with the connections H H, which form communications between the pipes G G and the steam-drum I. Said pipes G G also have lateral projecting connections *b b*, which connect with the flat sections J J, which latter also connect at the bottom with the side cylinders E E. These flat sections J J are cast in a single piece together with the stay-bolts *c c*, which are cast through holes in the cores on which these sections are cast. In Fig. 4 these stay-bolts *c c* are represented as being cast hollow, their junction with the main portion of the section rounded as there shown, to prevent their cracking from unequal expansion and contraction. The vertical pipes G G are also flat, as shown. *d d d* are gage-cocks. *e* is a feed-pipe, through which the water is introduced to supply the boiler.

The boiler may be readily cleaned by taking off the heads of the cylinders D and E E.

It will be observed, from a careful examination of the parts, that the steam-generating parts nearly fill the entire space of the furnace A, and at the same time sufficient space is left to insure a perfect circulation of the heat among the parts designed for the generation of steam, and hence a boiler of very great capacity may, when constructed as I have described, be contained in a very small space, while, at the same time, as the sediment formed in these steam-generating parts must all descend into the cylinders D and E E, the boiler can be easily kept clean.

Claims.

I claim as my invention—

1. The combination, with the reverberatory-furnace A, of the flat sections J J, made broader in the middle thereof than at their ends and stay-bolted by means of stay-bolts cast therewith, the pipes G G, the cross-cylinders or pipes F F, the cylinders or pipes D and E E, and the steam-drum or steam-chest I, substantially as hereinbefore set forth.

2. The sections J J, with stay-bolts cast in the same piece, and hollow, with the outer ends of the openings through them enlarged and the inside angles rounded, as shown, so as to unite the said stay-bolts with the shell of the section upon a curve both inside and outside, instead of at an angle, substantially as hereinbefore set forth.

DAVID RENSHAW.

Witnesses:
THOS. P. HOW,
ANNA M. NORTHROP.