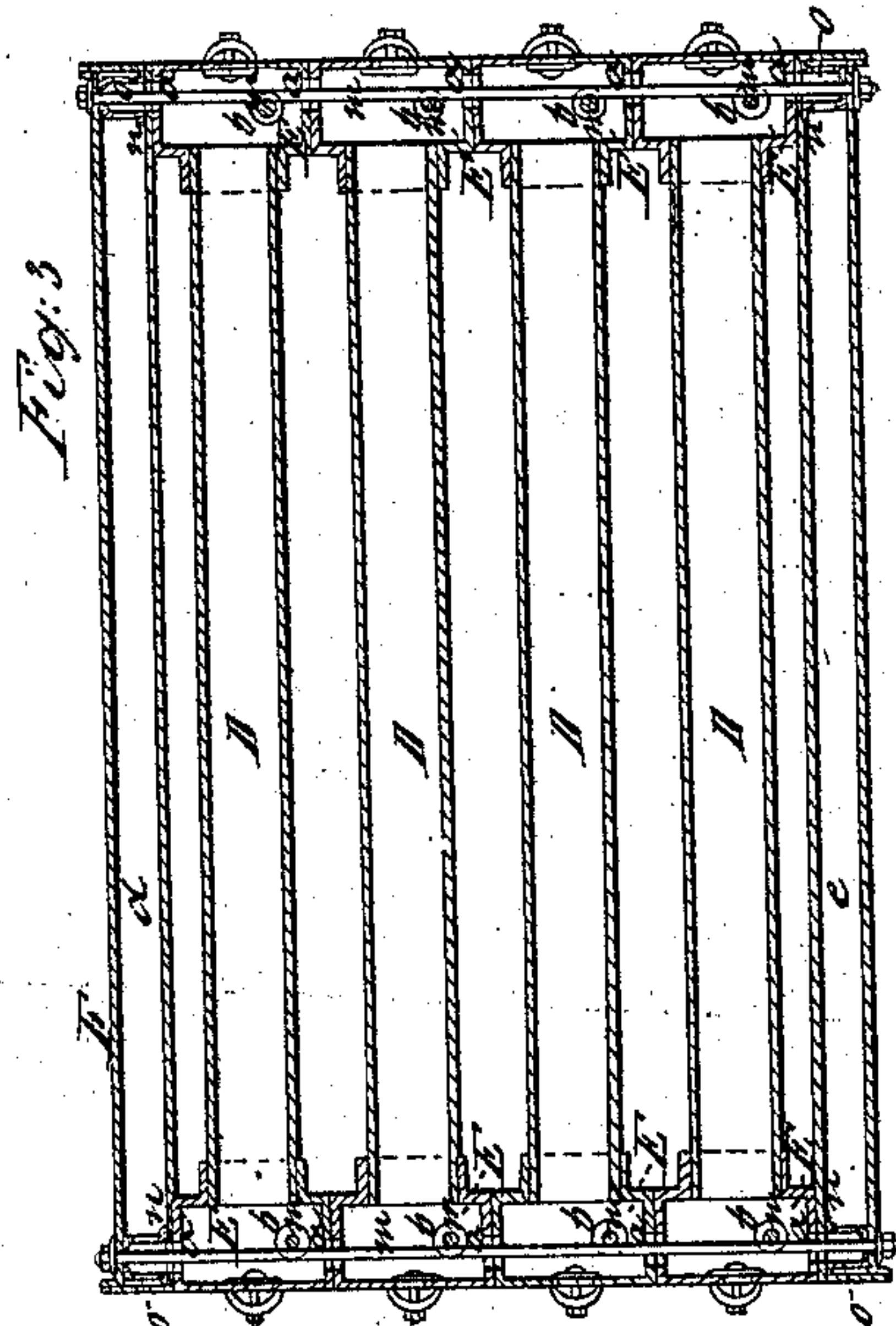
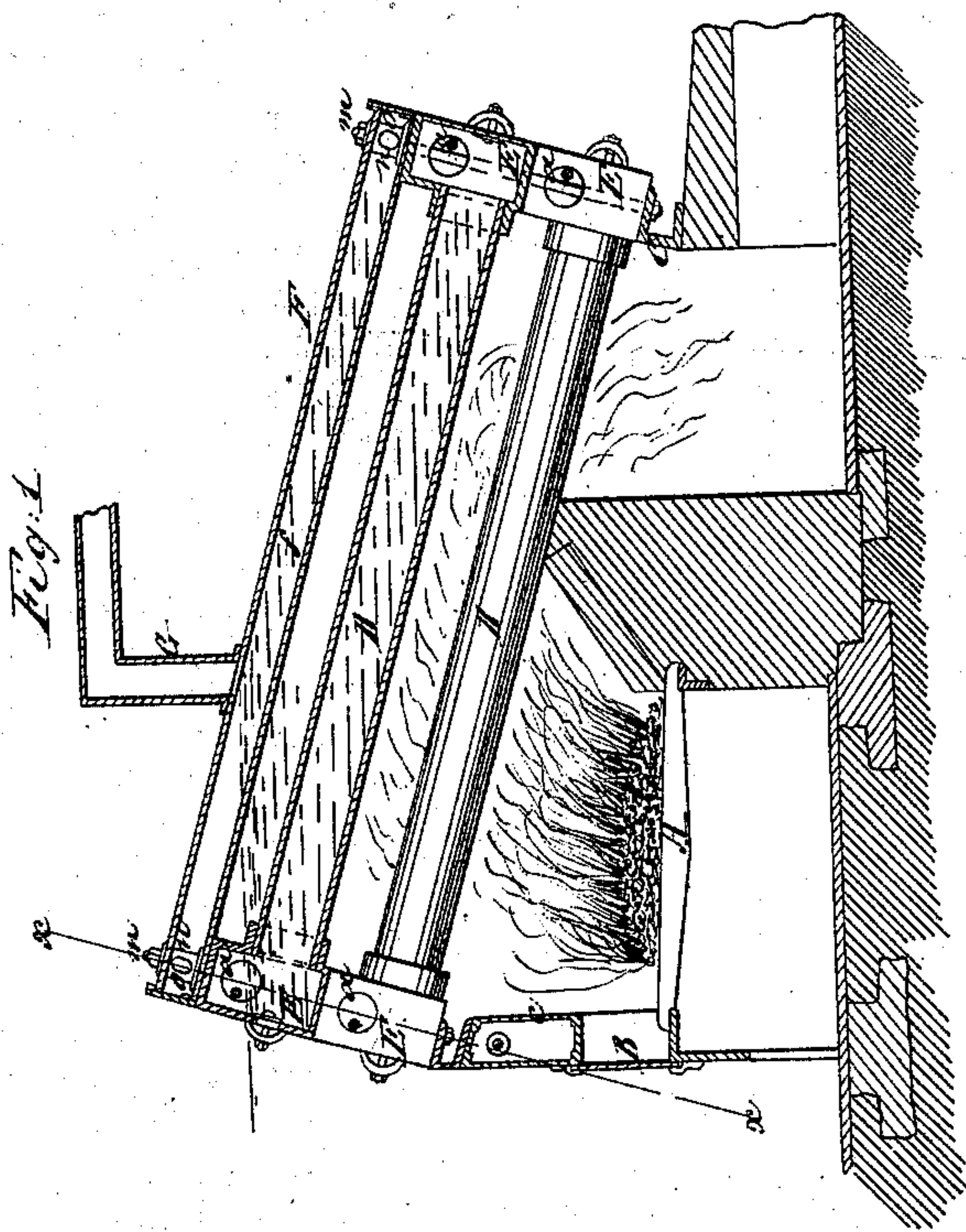
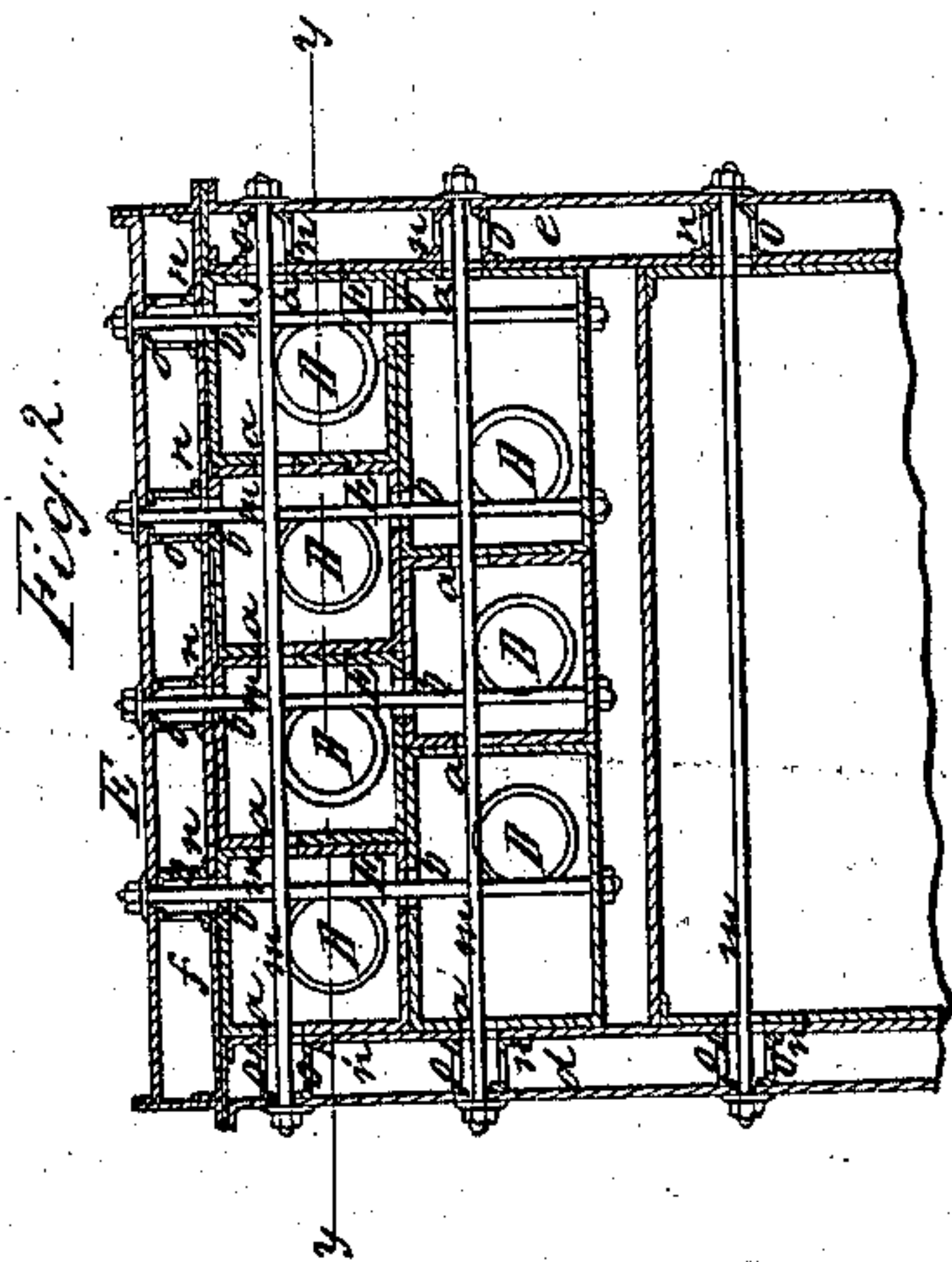


T. H. Muller.

Sectional Steam Boiler.

N^o 83,528.

Patented Oct. 27, 1868.



Witnesses.
Hermann Gros
Chas. Wahlerz

Inventor
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his attys

UNITED STATES PATENT OFFICE.

T. H. MÜLLER, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 83,528, dated October 27, 1868.

To all whom it may concern:

Be it known that I, T. H. MÜLLER, of the city, county, and State of New York, have invented a new and Improved Steam-Boiler; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of this invention. Fig. 2 is a transverse section thereof, taken in the plane indicated by the line *xx*, Fig. 1. Fig. 3 is a horizontal section of the same, the line *yy*, Fig. 2, indicating the plane of section.

Similar letters indicate corresponding parts.

This invention relates to certain improvements in a steam-boiler which is composed of a series of independent pipes, placed in an inclined position over the fire-place, and made to communicate with each other and with a common steam-dome, in such a manner that each pipe forms an independent water-space, which is exposed to the direct action of the fire, and from which the steam rises into the common steam-dome.

My present improvement consists in the arrangement of heads, which communicate with each other, both in a vertical and in a horizontal direction, and which are placed eccentrically to the center-lines of the respective pipes, in such a manner that a free circulation of the water takes place throughout the entire series of pipes, and that the water and steam, on rising from the elevated end of one of the pipes, will strike the top plate of the head before being permitted to rise through the opening in the top of said head to the next head above, or to the steam-dome, and that by these means the steam is disengaged from the water more readily than it would be if the heads should be placed concentrically with the center-lines of the pipes, in which case the water and steam issuing from the elevated end of a pipe rush right up together to the next succeeding head, and the steam is not readily disengaged from the water.

The invention consists, further, in the arrangement of a water-jacket surrounding the

inclined pipes, and connecting with the heads through openings in the sides and tops thereof, in such a manner that an additional heating-surface is created, and at the same time the water is free to circulate through the pipes, the heads, and the water-jacket.

The invention also consists in the arrangement of tubular brackets, perforated with holes in their sides, and inserted between the walls of the water-jacket, and of the heads, in combination with the screw-bolts passing through said brackets, in such a manner that the walls of the water-jacket and of the heads are relieved from all strain, and the circulation of the water and steam is not obstructed.

A represents the fire-grate of my boiler, to which access is had through the door B, in the usual manner. Over this grate, and supported in the rear by the wall C, and in front by the cross-chamber, containing the fire-door, is a series of inclined pipes, D, which are arranged in a zigzag position, as shown in Fig. 2 of the drawing, and the ends of which terminate in heads E. By placing the pipes in this position, they are better exposed to the action of the fire than they are if placed in regular rows, one above the other, as heretofore.

The heads connect with each other in a horizontal direction, through holes *a*, and in a vertical direction through holes *b*, and both the holes *a* and *b* are placed eccentrically with the center-lines of the pipes, so that the water and steam discharging from the elevated end of one of the pipes will strike the top and side plates of the head before being permitted to rush out through the holes *a*, or up through the holes *b*. By these means the steam is more readily disengaged from the water than it is if the holes *a* and *b* are placed concentrically with the center-lines of the pipes, as heretofore; and while the water, in striking the top and side plates of the head, is checked in its direct course, the steam disengaging therefrom rises up through the holes *b* and collects in the common steam-dome.

The pipes D are surrounded by a water-jacket, F, which is composed of four distinct chambers, *c d e f*. The chamber *c* extends in front of the boiler, under the elevated ends of the pipes D, and it communicates with the lateral

chambers *d e*. These chambers form the side walls of the boiler and furnace, and they communicate with the heads *E* at both ends of the pipes *D*, and also with the chamber *f*, which forms the top of the boiler, and which communicates with the upper rows of the heads *E*, as shown. From this last-named chamber extends a pipe, *G*, to the steam-dome, which, however, is not shown in the drawing. All parts of the water-jacket are thus brought in communication with the pipes *D*, allowing the water to circulate freely throughout the entire boiler, and an additional heating-surface is provided, whereby the steam-generating capacity of the boiler is materially increased.

By dividing the water-jacket in several distinct sections or chambers, I am enabled to take the same apart with great facility, and, if desired, each chamber may be constructed in one or more sections, so as to facilitate still further the operation of putting up or taking down the boiler. The chambers are connected together and to the heads *E* by the bolts *m*.

To enable the bolt to throw the pressure caused by the nut directly to the joint between the inner plate and the adjoining head or chamber, a brace, *n*, of peculiar construction is put in between the plates. This brace is formed by a piece of pipe, flanged on both ends, one flange inward, and the other outward, leaving the end leading to the head or chamber wide open for the free circulation of steam and water, and it is perforated in its sides with holes *o*, through which the circulation takes place.

By placing this bracket in between the plates of the chambers or heads, all the pressure caused by the nuts on the ends of the bolt is conveyed directly to the joints between the different parts, and no piece has to bear more strain than that caused by the pressure of steam, while if the bracket were omitted the stiffness of the outer plate would have to sustain and transfer the strain, which, in addition to the steam-pressure, would cause a danger of rupturing the same.

I do not claim as my invention the arrangement of heads at the ends of the pipes, such having been used heretofore; but,

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

1. The heads *E*, provided with openings *a* in their sides and openings *b* in their tops, placed eccentrically toward the center-lines of the pipes *D*, substantially as shown and described.

2. The perforated tubular brackets *n*, through which bolts *m* pass, arranged, with relation to water-jacket *F* and heads *E*, substantially as set forth.

3. The water-chambers *c d e f*, communicating with the heads *E* and inclosing the pipes *D*, substantially as shown and described.

T. H. MÜLLER.

Witnesses:

W. HAUFF,

ERNEST F. KASTENHUBER.