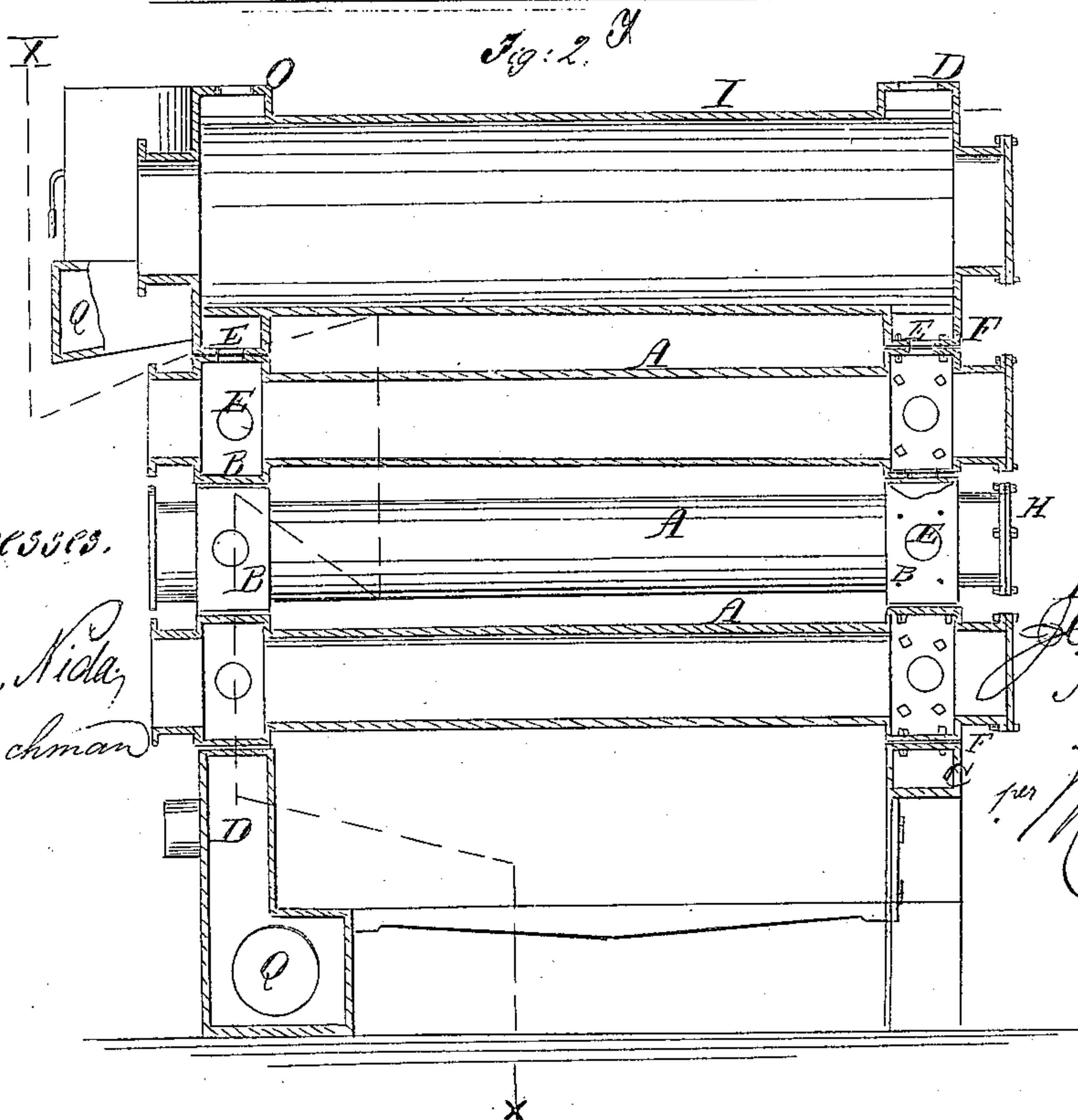
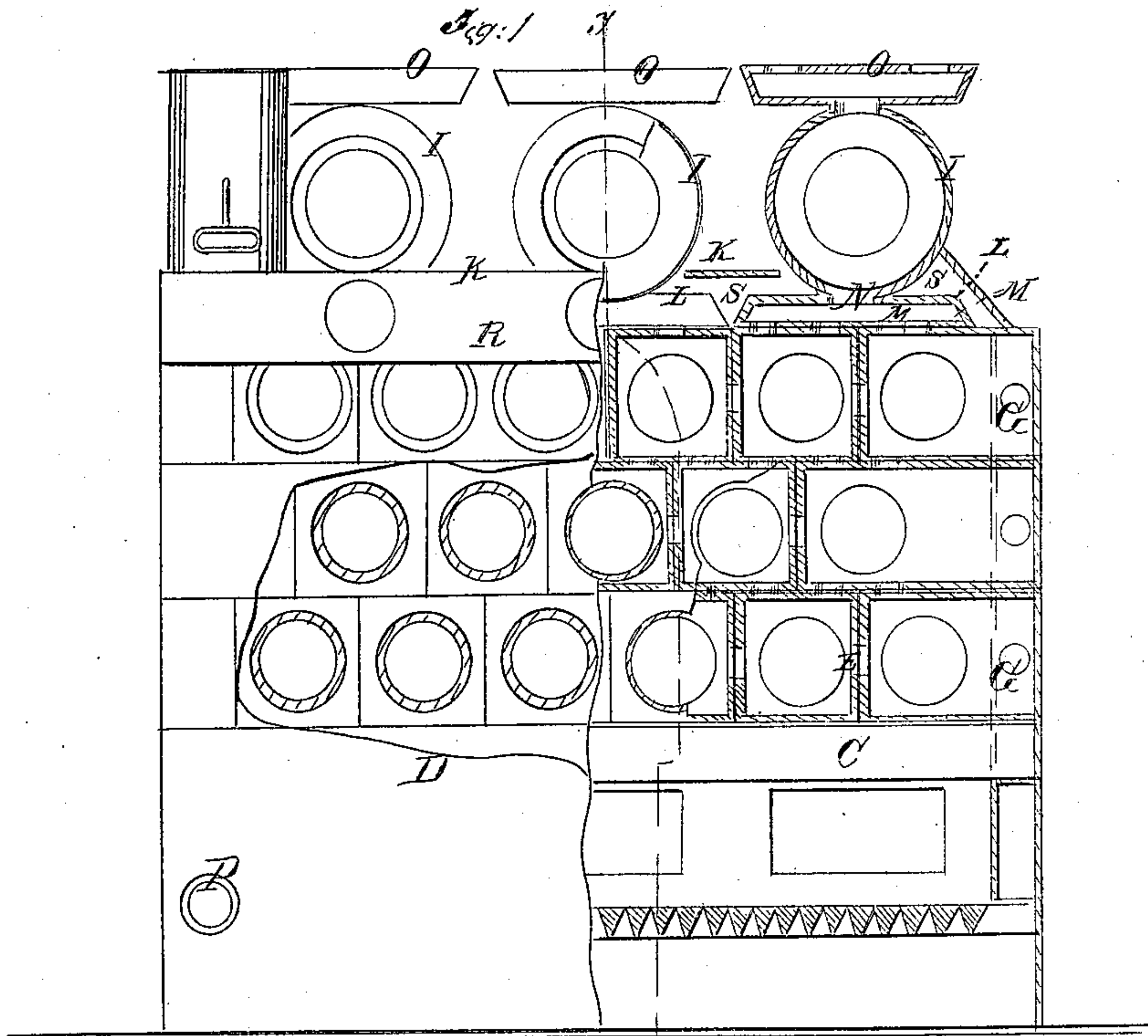


*J. I. Stevens,*

*Sectional Boiler.*

*No. 93,240.*

*Patented Aug. 3. 1869.*



*Witnesses.*

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Attorney*



# United States Patent Office.

HIRAM B. SMITH AND J. V. STEVENS, OF POMEROY, OHIO.

Letters Patent No. 93,240, dated August 3, 1869.

## IMPROVEMENT IN STEAM-GENERATORS.

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

To all whom it may concern:

Be it known that we, HIRAM B. SMITH and J. V. STEVENS, of Pomerooy, in the county of Meigs, and State of Ohio, have invented a new and improved Steam-Generator; and we 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 drawing, forming part of this specification.

The object of this invention is to provide an improved arrangement of steam-generating apparatus, calculated to simplify the construction and to facilitate the generation of steam economically; also to admit of changing the position of the tubes from time to time, placing the bottom sides upward, so that the scale previously formed will be thrown off, all as hereinafter more fully specified.

Figure 1 represents a partial transverse and sectional elevation, taken on the line *x-x* of fig. 2, and

Figure 2 represents a longitudinal sectional elevation, taken on the line *y-y* of fig. 1.

Similar letters of reference indicate corresponding parts.

We construct our improved boiler principally of tubes A, having rectangular chambers B at the ends, which in their united form constitute hollow end walls, and, when preferred, hollow side walls, a free water-circulation being maintained in the said tubes and hollow walls, and the fire-space being around the exterior of said tubes, and within the walls.

The lower tier of tubes is laid at the front, so that the walls of the rectangular chambers rest on a hollow mantel, or bridge, C, over the fire-doors, and at the rear upon the top wall of the mud-space D, and the other tubes are similarly laid on the first, so that the said chambers, mantel, and mud-space form double-end walls, having water-spaces, which communicate through holes E, suitably formed in the said walls of the chambers B, to coincide when the tubes are placed in position, and permit a free circulation in all directions between the said end walls and with the interior of the tubes.

These rectangular chambers B are of uniform size and shape, so that when placed in position they form close and compact walls, and they are designed to be packed around the passages E, to form steam-tight joints, by planing them to fit, and screwing them together by bolts F, or any suitable packing may be interposed, and, if preferred, the walls may have de-

pressions around the said passages for the reception of packing of rubber or other substance.

These chambers are thus bolted together on all sides, and they are similarly joined to the side walls and water-passages G, similarly formed between them.

The ends of the tubes are enclosed by heads H.

Any number of rows of these tubes may be thus built up, and above them, and rising over the top wall K, we propose to arrange large drums I, not having the rectangular chambers, but communicating with the upper tubes A, through passages L at each end, the lower walls of which rest on the rectangular parts of the said upper tubes, and have the proper communicating passages M therewith, while the upper walls support the said drums, and have passages leading into them.

These drums may have similar connections O at the top, for the steam dome, (not shown.)

P represents an opening into the space between the side walls, for cleaning the said space, and

Q, a similar opening to the mud-space.

Similar openings may be made for access to the hollow bridge C and to other parts.

R represents a hood, into which the product of combustion passes, over the top of the rear wall, and between the drums, as at S.

The double side walls may be dispensed with, if preferred, and brick or other walls substituted.

This arrangement of the tubes admits of changing them, by turning them over from time to time, to present new exterior surface to the action of the hottest part of the fire, when the parts most exposed have become weakened. This turning also serves a good purpose in removing the scale, which will be gradually thrown off when suspended from the upper surface of the tubes.

Having thus described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The tubes A, and chamber, or head B, formed in one piece, as herein shown and described.
2. The hollow bridge C, mud-chamber D, and tubes A, combined and arranged substantially as specified.
3. The combination of the tubes A and drums I, when arranged and united substantially as specified.

HIRAM B. SMITH.

J. V. STEVENS.

Witnesses:

GEO. D. HEBARD,  
GEORGE LEE.