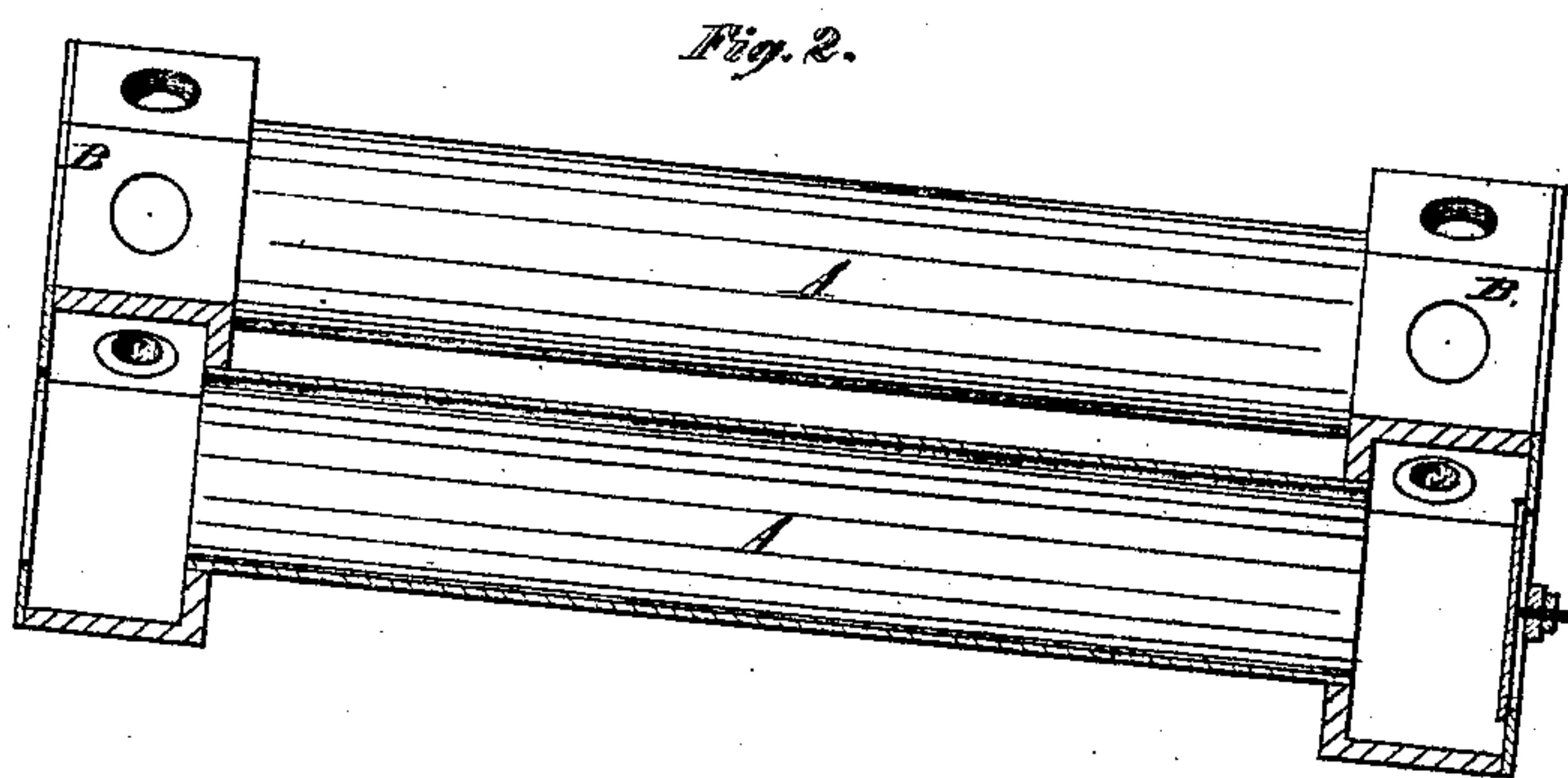
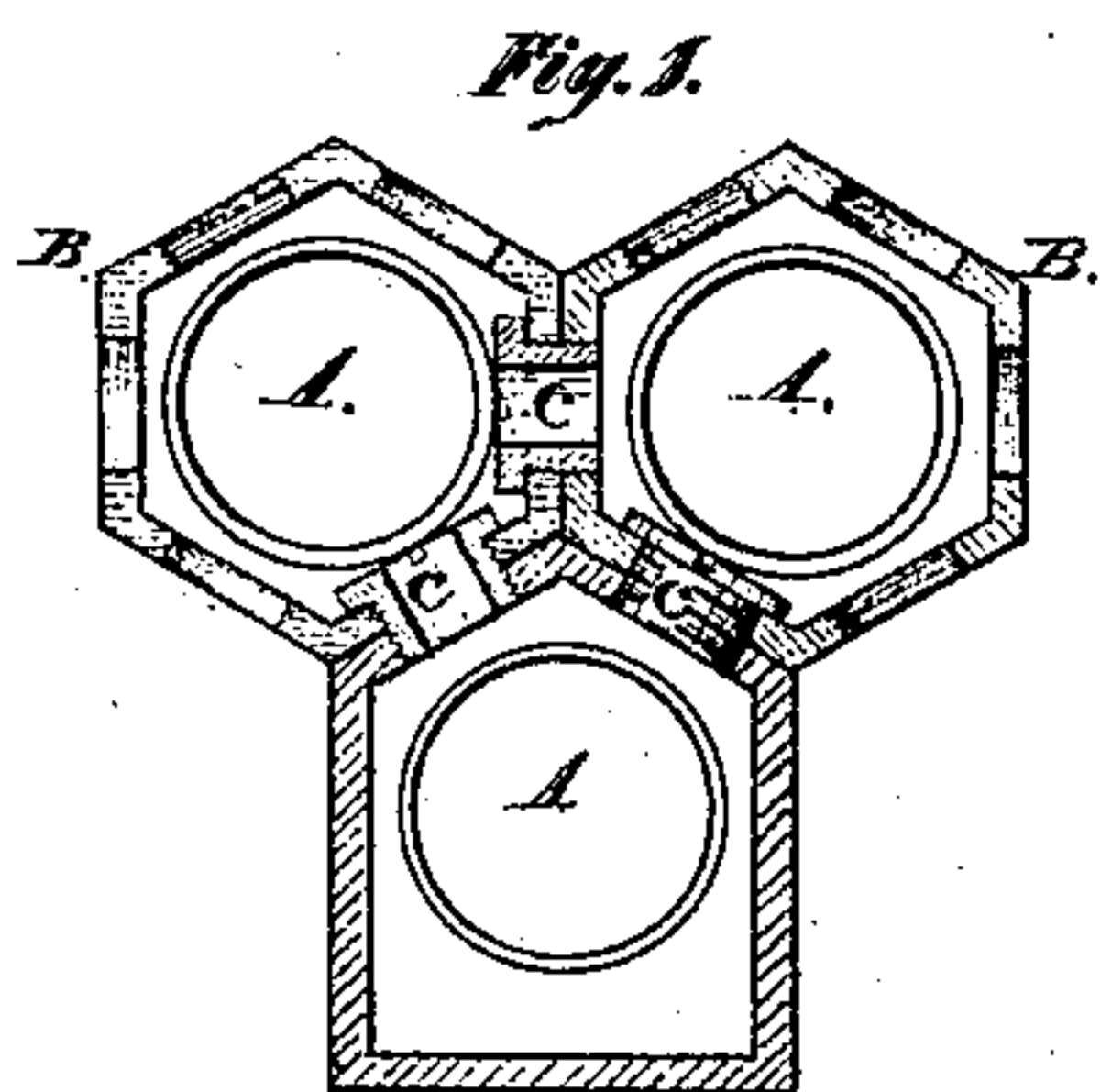


J. M. Clark,

Sectional Boiler.

No. 101,434.

Patented Apr. 5. 1870.



Witnesses.

J. C. Robbing
Lawrence E. Smith,

Inventor:

Jonathan M. Clark
by Attorneys
Brown, Coombs & Co.

United States Patent Office.

JONATHAN M. CLARK, OF NEW YORK, N. Y.

Letters Patent No. 101,434, dated April 5, 1870.

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 I, JONATHAN M. CLARK, of the city, county, and State of New York; have invented certain new and useful Improvements in "Steam-Generators," of which the following is a full, clear, and exact description, reference being had to the accompanying drawing through letters of reference marked thereon, forming part of this specification, and in which—

Figure 1 represents a sectional view taken transversely through the heads or connecting-chambers of a part of the apparatus.

Figure 2 is a vertical longitudinal section, taken through the center of fig. 1.

The same letters indicate like parts in both figures.

The object of this invention is to economize space, bring the water-pipes more closely together, and effect a detention of the products of combustion, by giving them a tortuous passage between the furnace and their exit; also, in a novel means of forming the connection by which the contiguous heads are united, and which form, also, passages for circulation of the water or other fluid through the entire range of pipes in every direction, laterally, angularly, and vertically.

Referring to the drawing—

A A represent a series of pipes, arranged parallel to each other, and side by side horizontally, but in each range upwardly the several pipes are intermediate of those of the adjacent range, whereby the products of combustion from the furnace beneath are deflected or caused to take a zigzag course between said pipes.

This is effected by using hexagonal hollow heads B for forming the connection between the several water-pipes, and which also form the end walls of the furnace. The lower and upper range of these heads may, however, be made rectangular at their lower and

upper sides, respectively, and the angular spaces at the sides of the tiers be filled by solid blocks of iron-stone or fire-brick, to complete the rectangular form of each end wall.

These hexagonal heads B are connected by tubular nipples C, formed with a flanged head at one end and an external screw-thread around the other, and are either provided with a nick to apply a screw-driver formed tool, or made angular internally for the insertion of a wrench, by which, when they are passed through the side of one head, they may be screwed into the adjacent one, to effect their connection, and, being tubular, to afford water or steam communication between the said heads.

By the use of hollow heads of hexagonal form a circulation laterally, diagonally, and vertically is, effected, and the pipes brought in the closest possible proximity to each other, thus economizing space, and by the tortuous passage through which the products of combustion have to pass, absorbing the largest possible proportion of caloric evolved.

Having thus described my invention,

What is claimed, as new and desired to be secured by Letters Patent, is—

1. The hexagonal hollow heads B, in combination with the pipes A, forming a zigzag arrangement, and having lateral and diagonal tubular connections, for the circulation of water and steam therethrough, substantially as specified.

2. The tubular screw-nipples C, constructed with a flange or collar on one end for uniting the heads B in the manner set forth.

JONATHAN M. CLARK.

Witnesses:

SYDNEY E SMITH,
GEO. E. HALE.