

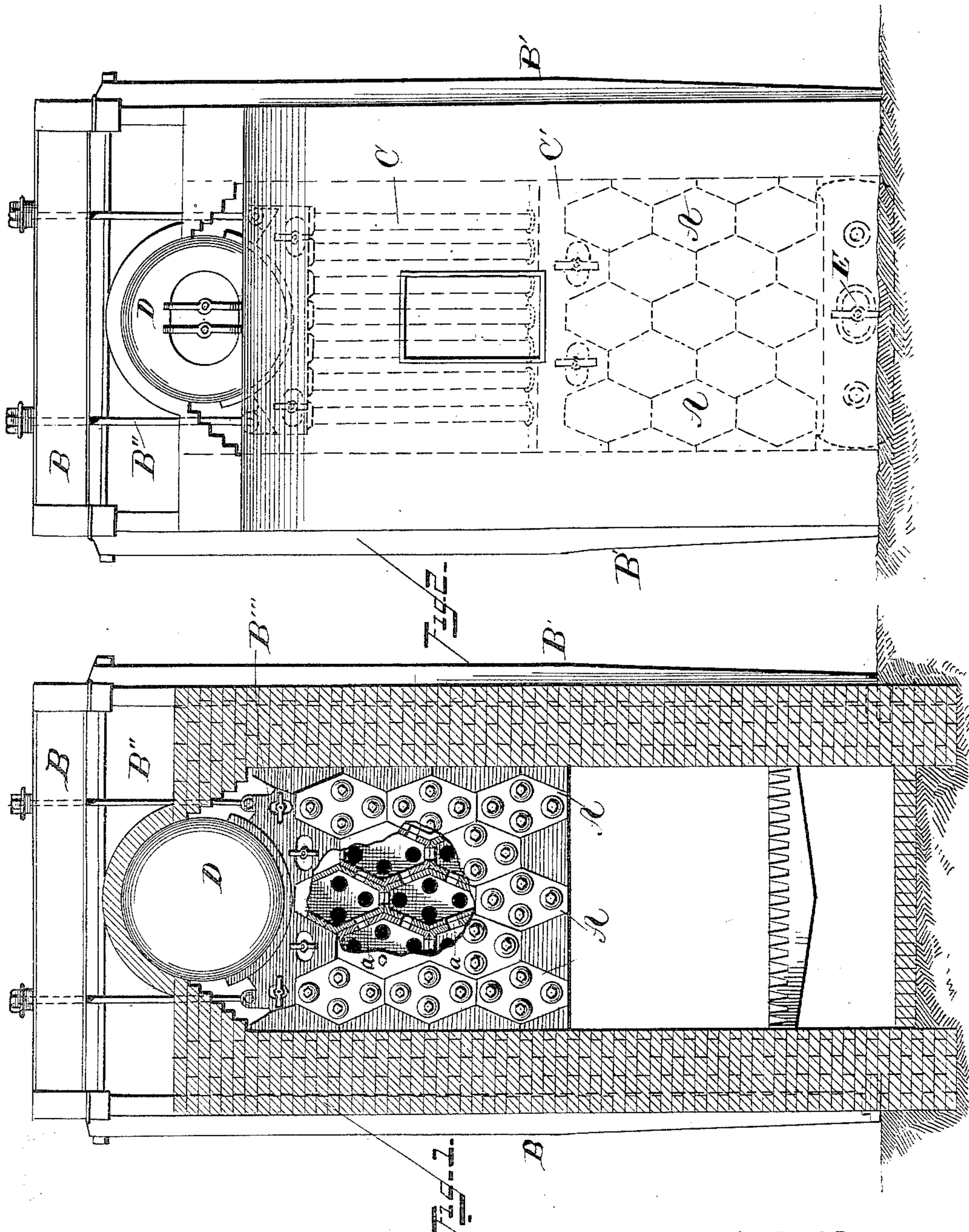
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3 Sheets—Sheet 1.

W. H. SMITH.
STEAM BOILER.

No. 424,735.

Patented Apr. 1, 1890.



WITNESSES
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H. M. Sterling.

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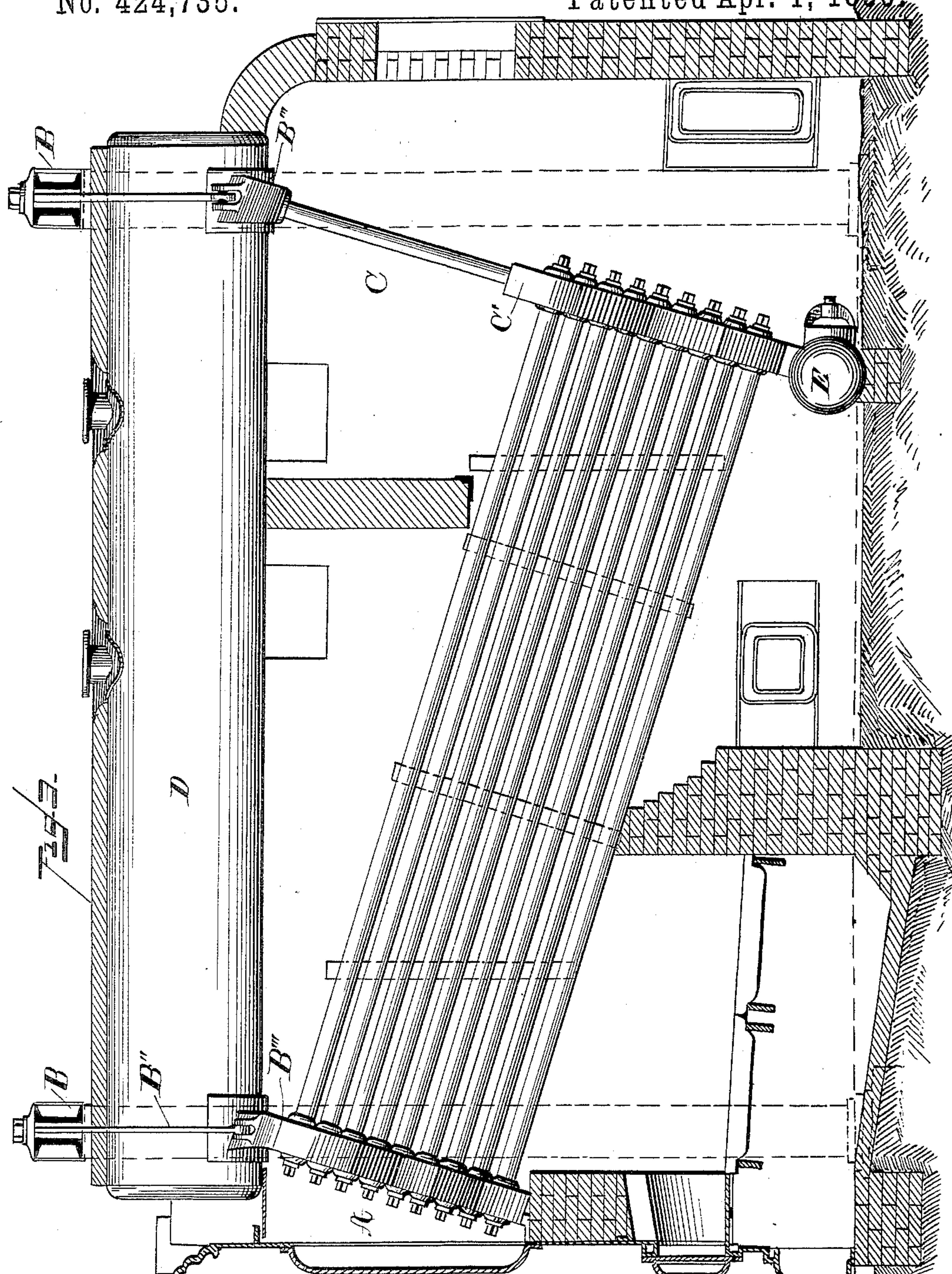
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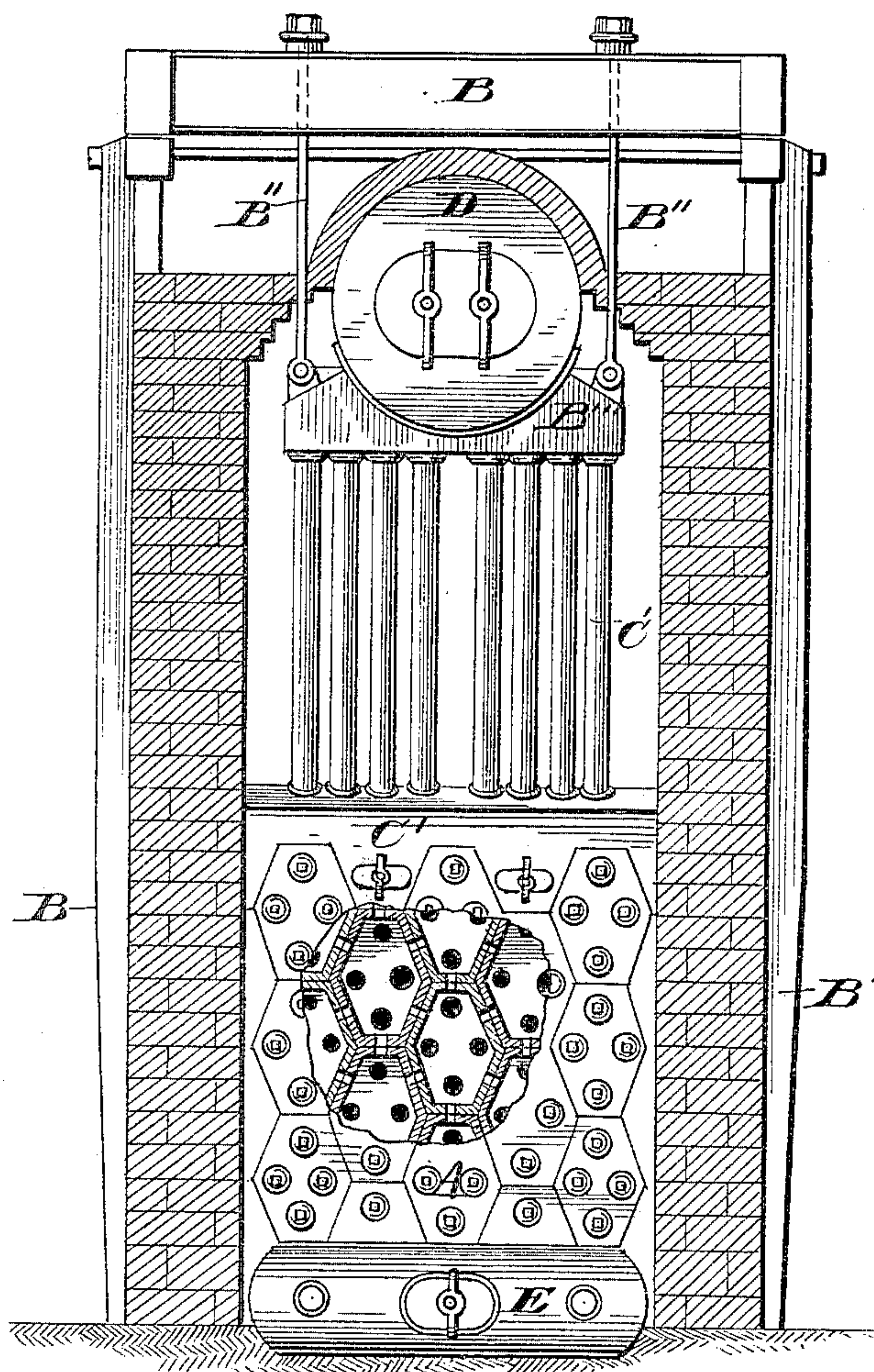
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~~Fig. 4~~



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM H. SMITH, OF CHICAGO, ILLINOIS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 424,735, dated April 1, 1890.

Application filed September 16, 1889. Serial No. 324,130. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SMITH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in steam-boilers, and more particularly to that class known as "water-tube boilers."

The object of my invention is to support the battery of water-tubes in which the water is heated and generated into steam from suitable supports independent of the steam-drum, and also to provide a saddle which connects with the headers of the water-tubes and with the steam-drum, and by which the battery of water-tubes is supported.

The invention consists, first, in supporting the water-tubes or header-sections from a cross beam or support through rods, and also the steam-drum.

It further consists in connecting the front end of the battery of water-tubes with a saddle supported by rods connected with cross-beams, and in supporting the steam-drum in the saddle to communicate with the battery of water-tubes, whereby the weight of the tubes is supported wholly from the beams, as also the steam-drum.

The invention further consists in the saddle supported by the cross-beams, having the several headers connected therewith and forming a communicating passage-way between the headers and steam-drum.

It further consists in a novel manner of supporting the rear end of the battery of water-tubes.

It further consists in certain novel features in the construction and arrangement of parts, all as hereinafter explained.

In the accompanying drawings, Figure 1 is a front view of a boiler, partly in section, showing the saddle to which the headers are connected, and the front cross-beam, and the rods for supporting the saddle. Fig. 2 is a rear elevation showing a similar manner of supporting the rear ends of the tubes. Fig.

3 is a longitudinal section through the casing, showing the water-tubes and steam-drum in full lines. Fig. 4 is a rear view showing the upper and lower saddles and the means of connecting the same together and with the header.

The headers or sections A are made in polygonal form, with the several sides of one section abutting against and connected to others of the series, the connection being made by means of wrought-iron or steel nipples *a* expanded between them, by which it will be seen that each one of the series is connected at the top and bottom, and at its opposite parallel sides another one of the series, and at each of its four angular sides with another of the series, both ends being constructed in a similar manner and having the tubes connected to each section in a similar manner to boilers provided with headers in common use.

To a cross-beam B, supported at each end upon a column B', are connected depending rods B'', to the lower ends of which are connected in any suitable manner a saddle or support B''', having angular and parallel faces corresponding to the shape of the upper and lower headers, and to which saddle said headers are connected in a similar manner as to each other. This saddle is made in hollow form, with its upper face concave or formed on the arc of a circle corresponding to the diameter of the steam-drum, and in which concave portion the steam-drum rests. The drum is cut away at the point over the hollow saddle, and the drum and saddle are connected through a steam-tight joint, and from which it will be seen that the battery of water-tubes is supported entirely independent of the steam-drum. It will also be seen that the saddle forms a connecting passage-way between the several sections of the headers and the steam-drum. The headers at the rear end are connected together in a similar manner to those at the front, and a saddle is also employed to support the steam-drum at the rear end; but in this case the saddle, which is connected directly to the cross-beam, is provided with a series of depending circulating pipes or tubes C, having at their lower end a similar saddle C', which in this case is provided with angular and upper and lower parallel faces corre-

sponding to the shape of the headers, and to which saddle the headers are connected as to each other.

5 The mud-drum E is formed with upper and lower parallel and vertical faces in such manner that the drum shall communicate with the header through both parallel and vertical openings.

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

1. In a steam-boiler, the water-tubes, the cross-beam or support, the rods connected to the water-tubes to support the tubes or header-sections, and the steam-drum, also supported by the rods, substantially as described.

2. The battery of water-tubes, having its front end supported by a saddle, the cross-beam, and rods connecting the cross-beam with the saddle, and the steam-drum supported by the saddle to communicate with the headers of the water-tubes through the saddle, substantially as described.

3. The saddle supported by the cross-beam, having the several headers connected therewith and forming a communicating passage-way between the headers and the steam-drum, substantially as described.

4. The steam-drum having its rear end supported by a saddle suspended from a cross-beam, a series of circulating-pipes connected to the saddle supporting the drum, and a saddle connected to the lower end of the circulating-pipes, having vertical and upper and lower parallel side faces, and openings therein to match the header-sections, substantially as described.

5. The battery of water-tubes, having its rear end supported by a saddle, the cross-beam, and the rods connecting the cross-beam with the saddle, and the tubes connecting the saddle with the headers of the water-tubes, substantially as described.

6. The header-section provided with opposite parallel side faces having openings therein, and a mud-drum having corresponding matching faces, provided with openings communicating with the header-section through both the vertical and parallel sides, substantially as described.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

WILLIAM H. SMITH.

Witnesses:

L. W. SINSABAUGH,
H. M. STERLING.