

No. 689,829.

Patented Dec. 24, 1901.

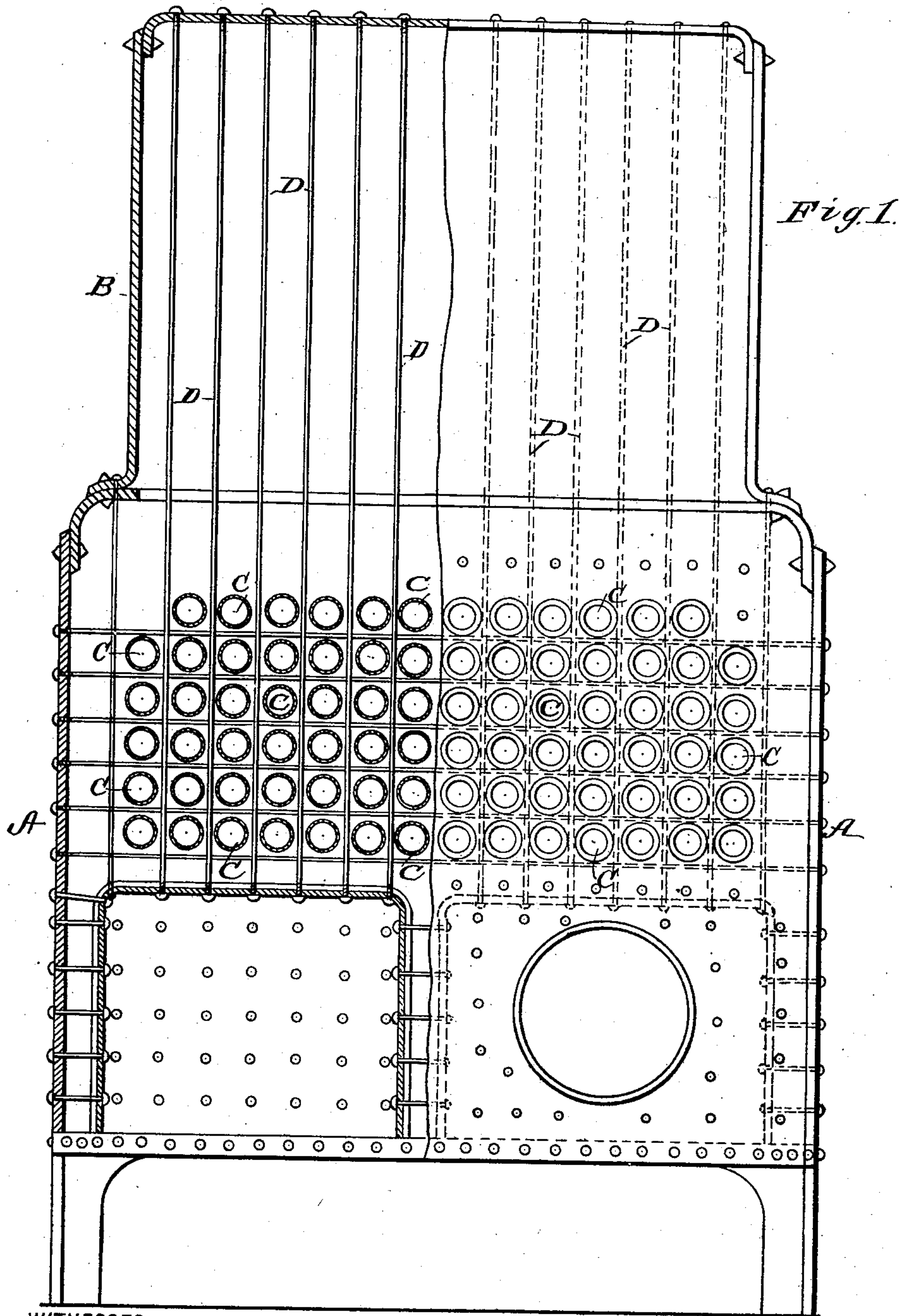
W. N. OLDMAN.

STEAM BOILER.

(Application filed Sept. 23, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES;

W. R. Edelen,  
Amos W. Hart

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BY Munroe & Co.

ATTORNEYS

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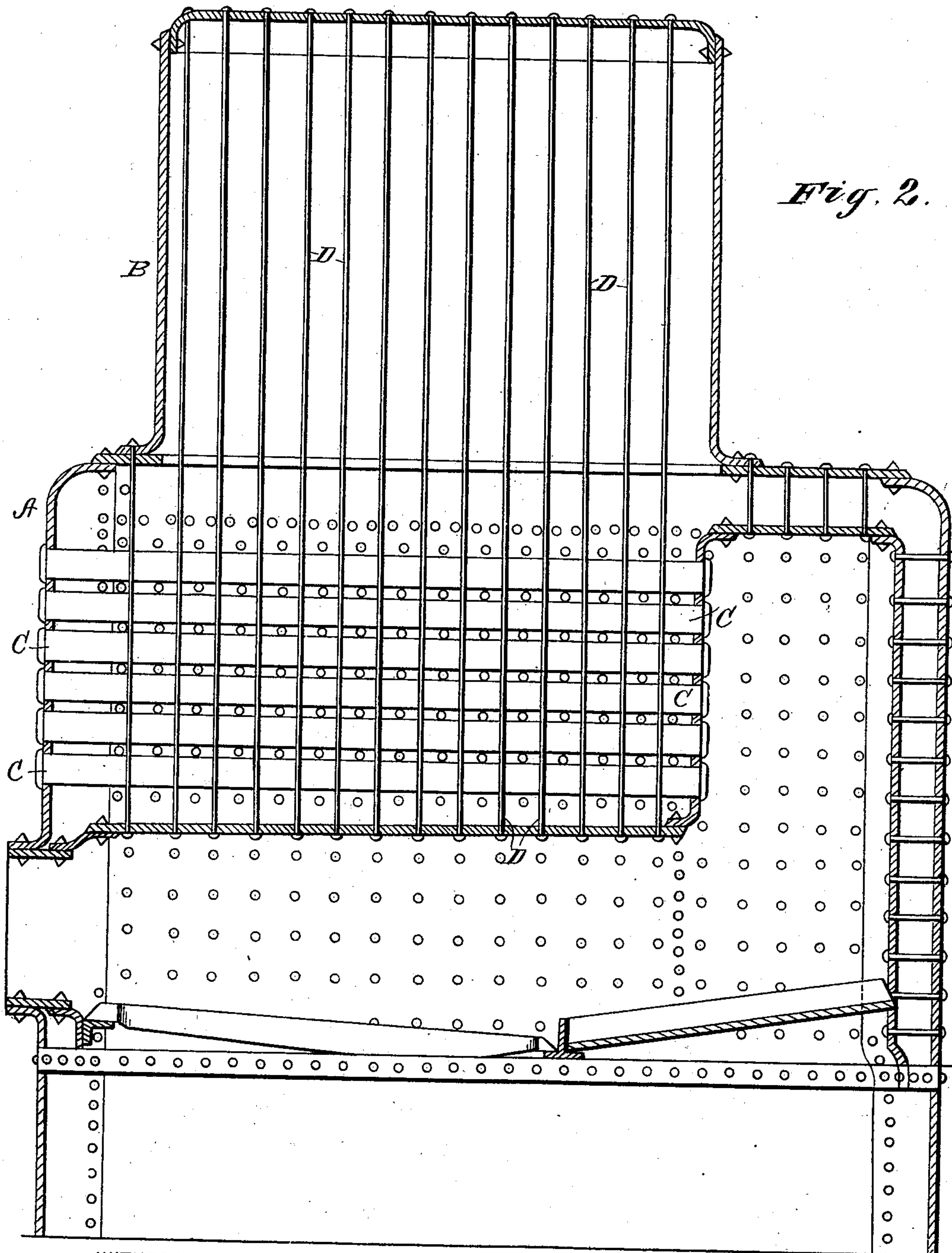
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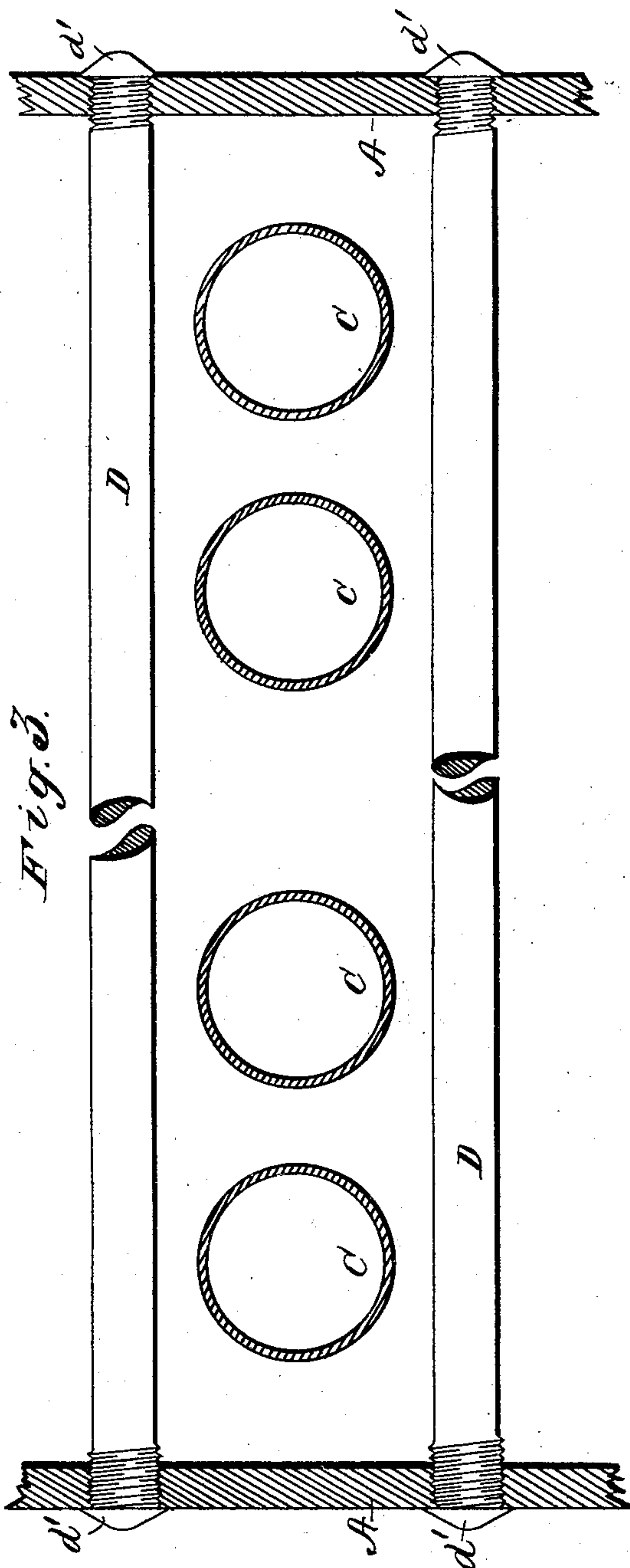
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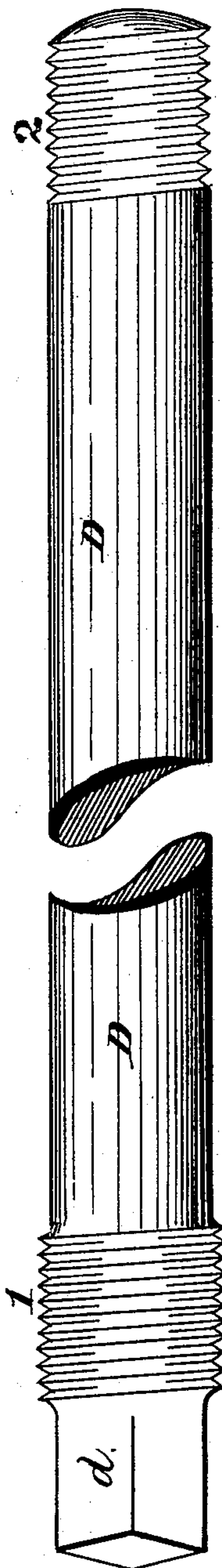
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3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM NELSON OLDMAN, OF BUFFALO, NEW YORK.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 689,829, dated December 24, 1901.

Application filed September 23, 1901. Serial No. 76,250. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM NELSON OLDMAN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have made certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

It is the object of my invention to provide an improvement in the class of fire-tube boilers whereby they are adapted to sustain greater steam-pressure than heretofore.

I have devised and put in practical use a boiler constructed according to my invention and which is hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is in part a front view and in part a sectional elevation. Fig. 2 is a vertical section of the boiler in a plane at right angles to that shown in Fig. 1. Fig. 3 is an enlarged transverse section further illustrating the arrangement and attachment of stay-rods. Fig. 4 is a side view of a stay-rod enlarged.

As shown, the base portion A of the boiler is rectangular and the top portion or steam-dome B is cylindrical. The fire-tubes C, extending through the main portion of the boiler from front to rear, are arranged equidistantly in horizontal and vertical rows. Between the rows of fire-tubes C are arranged stay-bolts D, as shown—that is to say, a stay-bolt passes between each two vertical rows and also between two horizontal rows of tubes C, but without contact therewith. Thus the stay-rods are spaced equidistantly, like the tubes C. Each stay-rod is constructed with a screw-thread at each end, so that it may be screwed through the opposite side walls of the boiler, and after being thus inserted the ends are upset or riveted, as shown in Fig. 1. As illustrated in Fig. 4, each stay-rod D has a slight enlargement at 1 adjacent to its head, which is screw-threaded, as shown. The other end of the stay is also screw-threaded, as shown at 2, but the thread is cut upon the normal diameter of the stay. These threads 1 and 2 are differential—that is to say, in the case of the part 1 the threads are ten to the inch, while on part 2 the threads are nine to the inch. It is apparent that by this construction when a stay-rod is being inserted the entering end 2 will travel a little faster

than the end 1 and will therefore tend to draw the body of the rod straight, whereby sagging or downward bend of the same is prevented. This construction likewise insures a practically equal tension of all the stay-rods, so that the sides of the boilers are braced or tied together under equal strain and the horizontal rods supported in such manner that they are not liable to come in contact with the fire-tubes below them. After the rods D have been thus inserted in place the square butt *d*, Fig. 4, is cut off and the ends are riveted, as shown at *d'* in Fig. 3, thus forming a perfectly secure fastening and water-tight joint.

The arrangement of the stay-rods D in rows between every two vertical and horizontal rows of tubes insures uniform distribution of strain, so that cracks or leaks are not liable to occur and a maximum strength is obtained. In fact, by the described arrangement of stay-rods with the fire-tubes I produce a boiler capable of withstanding a high pressure of steam, or nearly double that of cylindrical fire-tube boilers having stay-rods arranged in the usual way. Further, in my boiler the equidistant arrangement of fire-tubes and stay-rods provides uniform spaces, and hence a uniform circulation of water among and around the several tubes, whereby steam is generated to better advantage and the durability of the boiler is increased. Besides this I am enabled to dispense with reinforce or side plates for strengthening and bracing the sides of a boiler, as in the usual arrangement of stay-rods and fire-tubes.

What I claim is—

The improved fire-tube boiler having a rectangular body, a series of rows of fire-tubes arranged horizontally and equidistantly, a series of rows of threaded stay-rods arranged equidistantly between each two rows of fire-tubes both vertically and horizontally, the screw-threads at the entering ends of the stay-rods being greater in number for the same space than that at the opposite ends, as shown and described.

WILLIAM NELSON OLDMAN.

Witnesses:

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JOSHUA D. COUSINS.