

(No Model.)

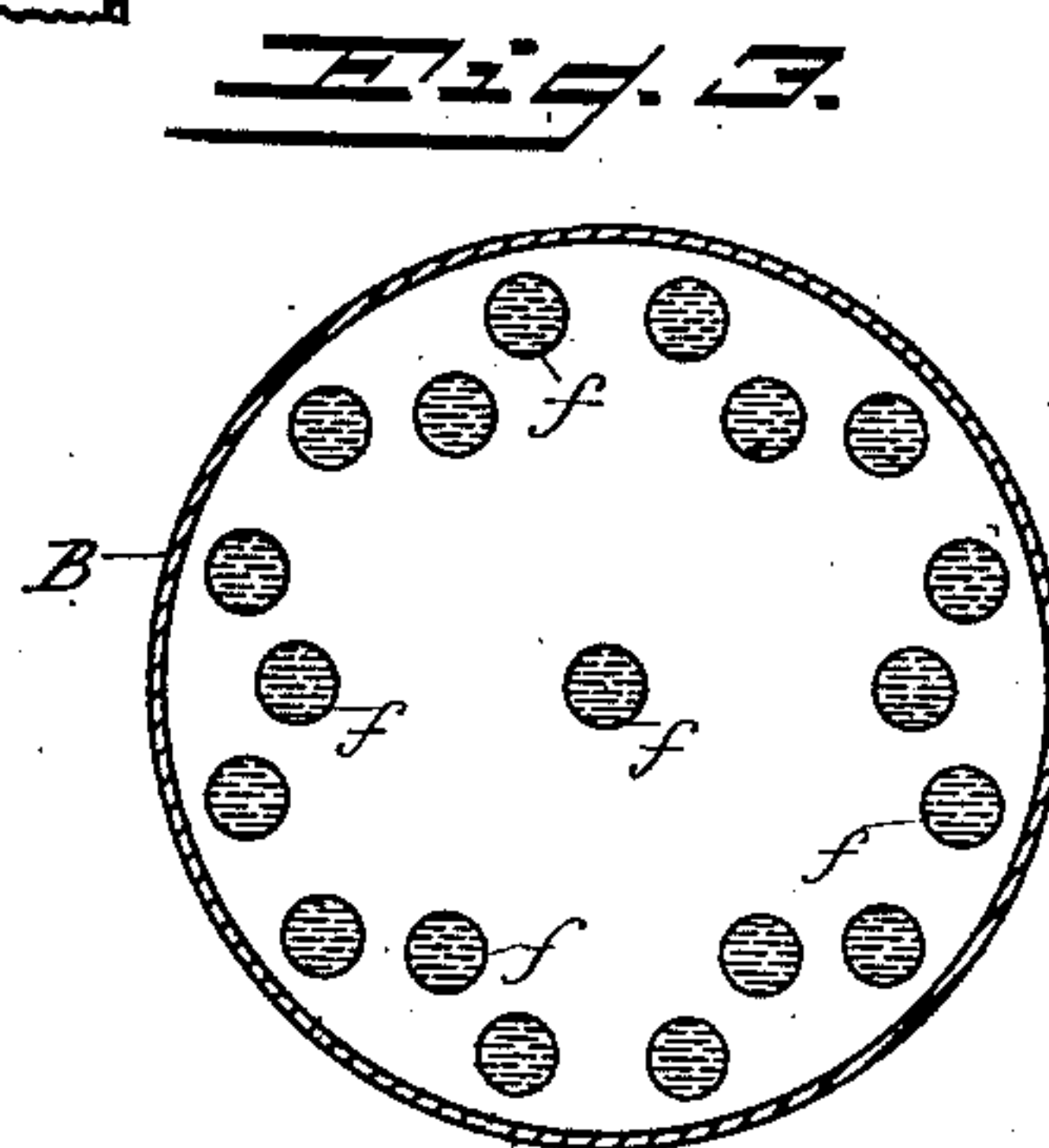
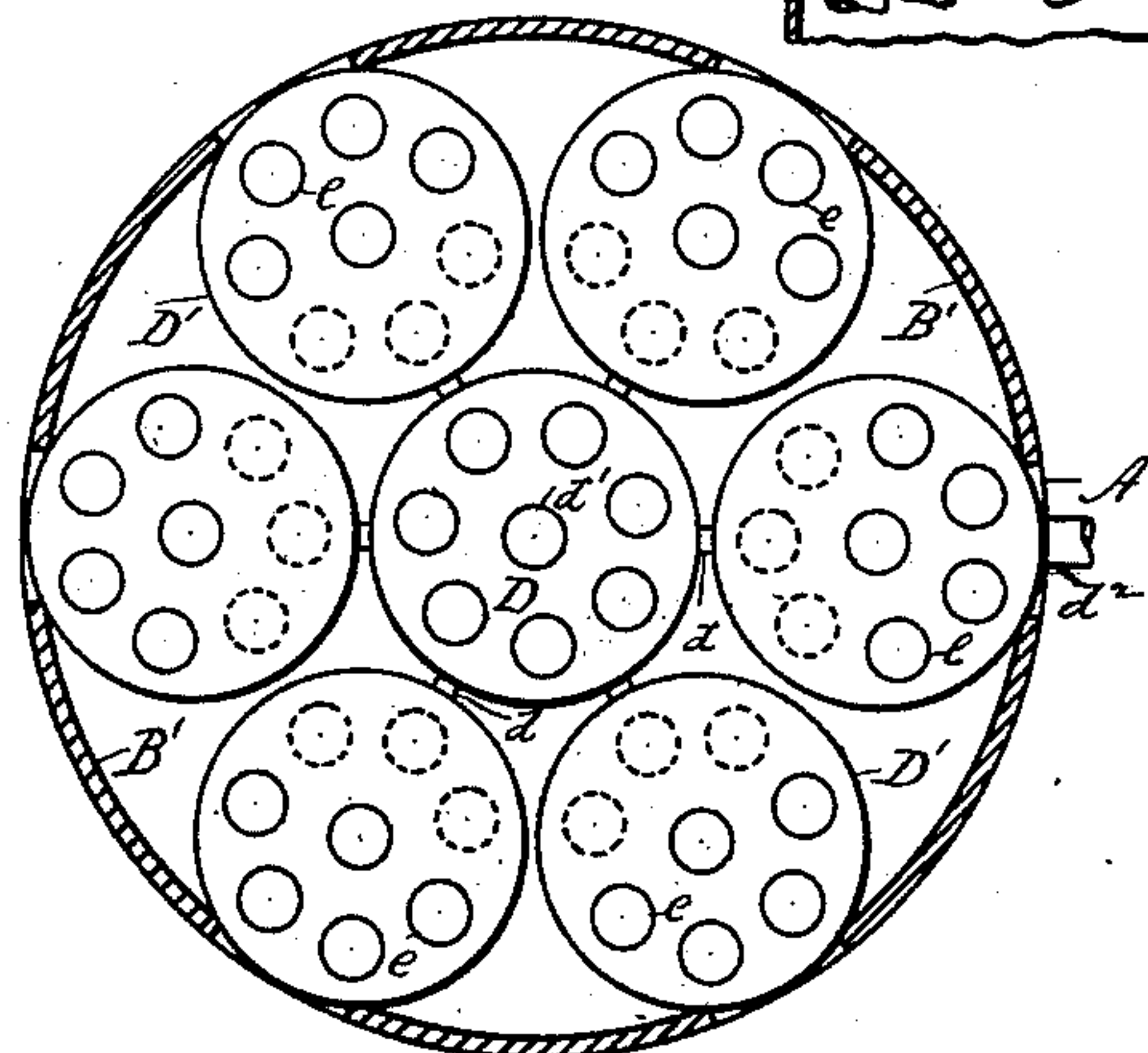
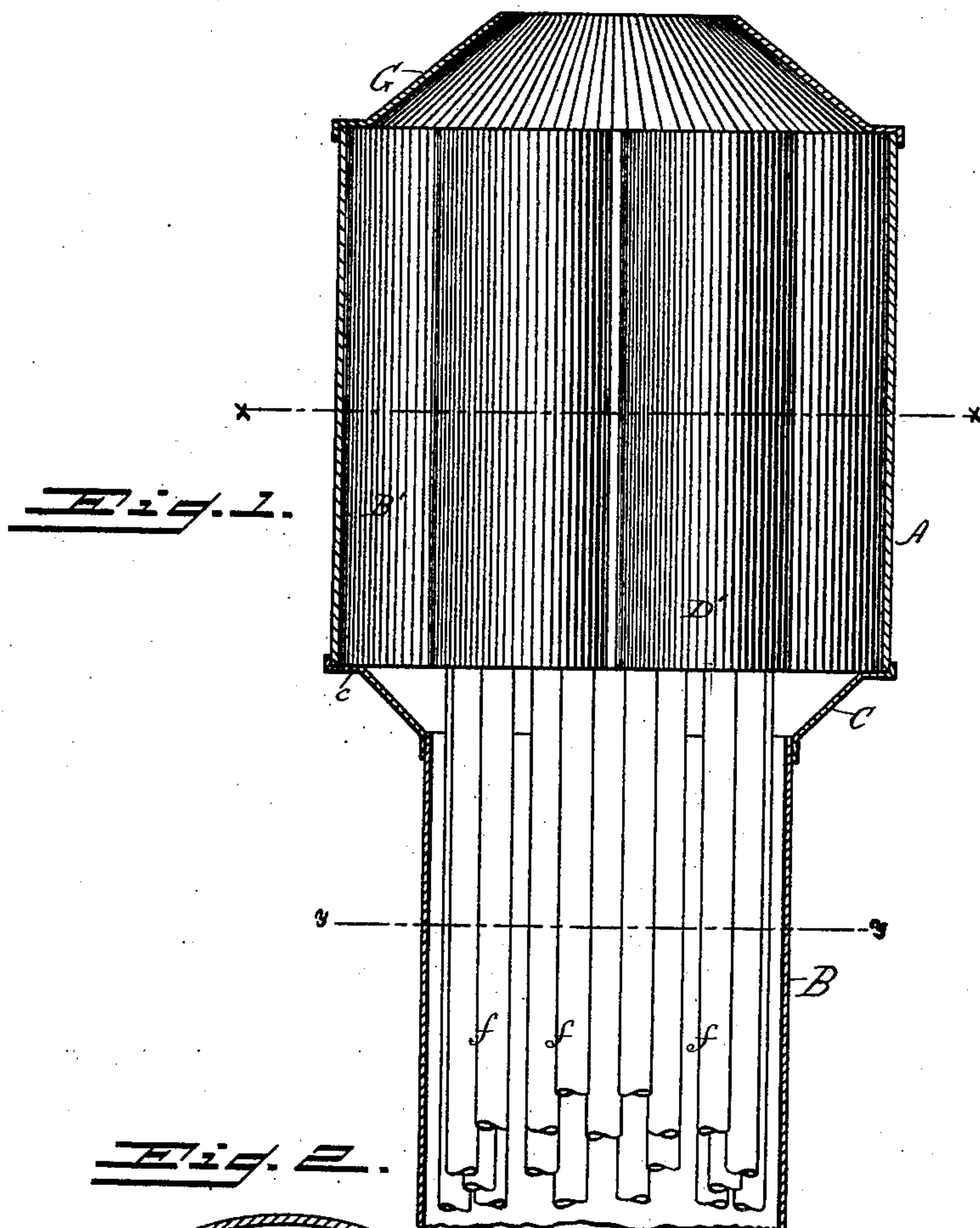
2 Sheets—Sheet 1.

L. D. COPELAND.

STEAM BOILER.

No. 360,759.

Patented Apr. 5, 1887.



WITNESSES.

Willie Powell.
J. B. McGinnis.

INVENTOR

Lucius D. Copeland,
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Attorneys.

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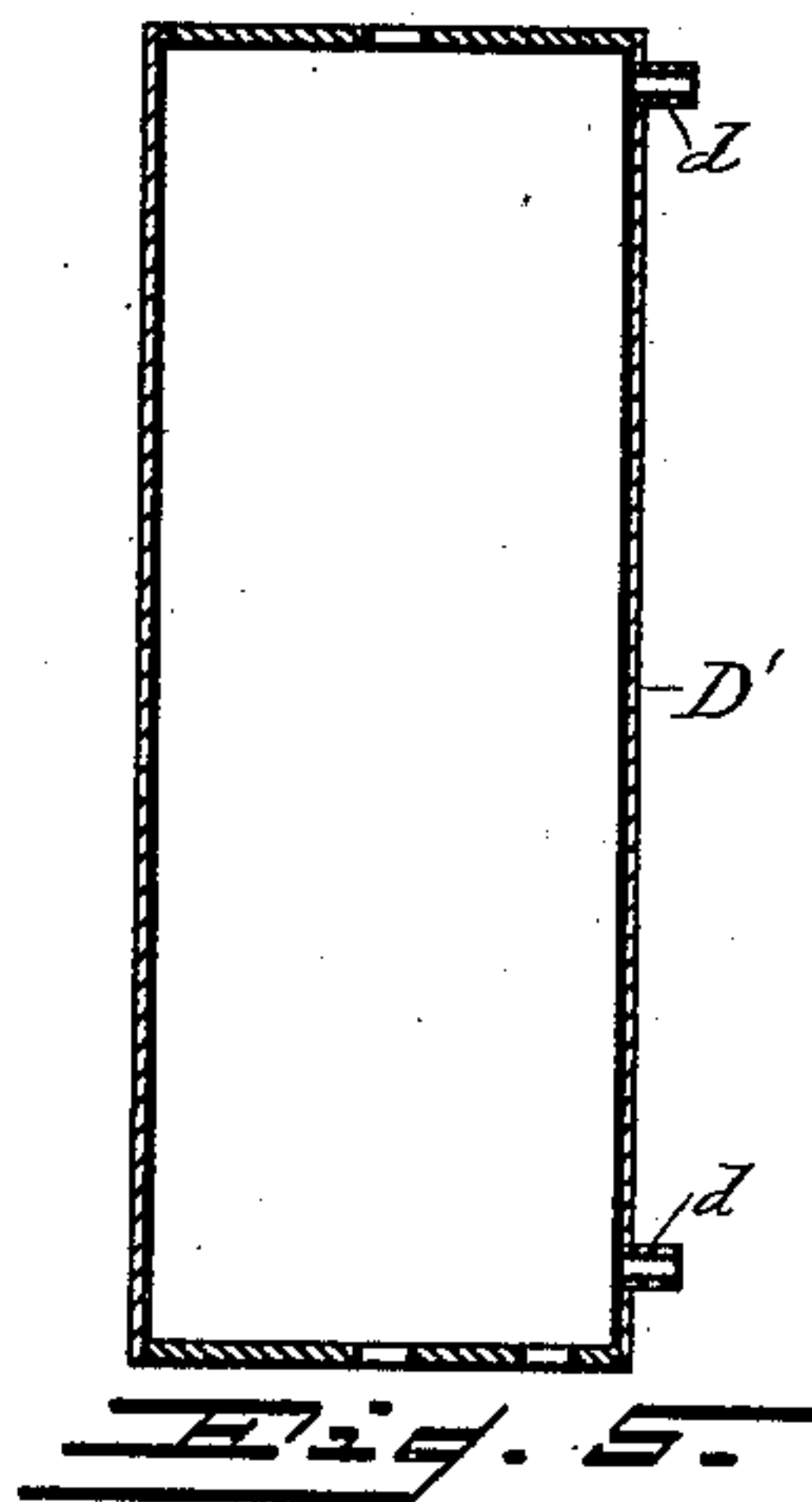
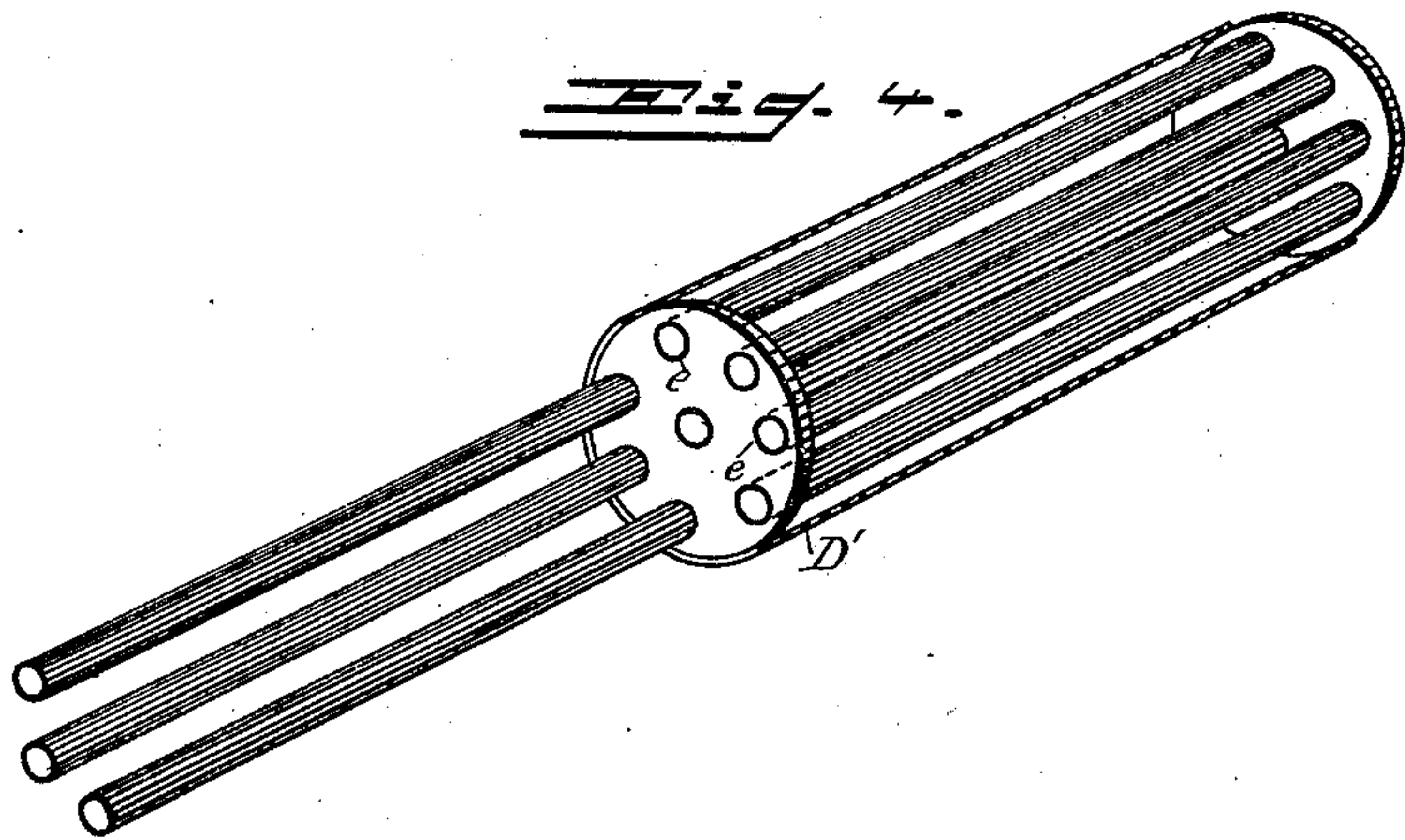
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UNITED STATES PATENT OFFICE.

LUCIUS D. COPELAND, OF CAMDEN, NEW JERSEY.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 360,759, dated April 5, 1887.

Application filed October 11, 1886. Serial No. 215,881. (No model.)

To all whom it may concern:

Be it known that I, LUCIUS D. COPELAND, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a vertical section of a boiler embodying my improvements. Figs. 2 and 3 are horizontal sections on lines $x x$ and $y y$, respectively, of Fig. 1. Fig. 4 is a perspective of one of the cylinders, partly in section, of my invention; and Fig. 5 is a vertical section of one of said cylinders, the water-legs and fire-flues being omitted.

My invention has for its object to provide an improved construction of safety-boilers, specially designed for use on steam-tricycles and similar riding-vehicles, but applicable for use in connection with other appliances.

My improvements consist in the peculiar construction and combinations of parts hereinafter referred to and specifically claimed.

Referring to the accompanying drawings, A and B represent two main cylinders, connected by a conical section, C, which said parts form the shell or casing of the boiler, which shell should be lined with asbestos or other incombustible non-conductor to retain the heat. As shown in Fig. 2 of the drawings, the lining is composed of sectional pieces of asbestos $B' B'$, applied to the walls of cylinder A, between the cylinder D' , hereinafter described.

Within the main cylinder A, and supported upon a balcony, c , of the section C, are a number of cylinders, $D D'$, &c. Any desired number of these cylinders may be used, though I have illustrated seven—one central cylinder and six others surrounding it. The central cylinder, D, is connected at or near its top and bottom with the surrounding cylinders $D' D'$ by short pipes or communicating-passages $d d$, &c., so that there shall be a circulation between them. The cylinders $D D'$ have fire-flues $e e$, extending from end to end, and drop or pendent water legs or tubes $f f$, which extend from the bottoms of the cylinders, as shown, down into the main cylinder B, the

latter constituting the fire or combustion chamber, in which may be a grate, atomizer, or other adjunct for burning fuel, either solid, liquid, or gaseous. The central cylinder, D, has six flues and one central water-leg, and the surrounding cylinders have each five flues and three water-legs, the latter being located near the central cylinder; but the number of flues and water-legs may be varied and their arrangement changed, as my invention is not limited to any particular number or arrangement.

The fire-tubes are open at both ends and discharge into an upper chamber formed by a surrounding conical cap, G, while the water legs or tubes are open at top, where they communicate with the interior of the cylinders, and are closed or blank at their lower ends.

The central cylinder has an opening, d' , through which the steam generated in the boiler is drawn off, and water is supplied through a pipe, d'' , leading into one of the outer cylinders.

It will be noted that by the described construction a safety-boiler is produced in which the water is distributed into small bodies, so that results from explosions are diminished or lessened, with which the heat in the fire-chamber or casing and flues can come into close contact, while steam can be "got up" quickly.

It will be noted that steam is taken from the central cylinder only, the steam generated in the outer cylinders passing into said central cylinder. As this latter is surrounded on all sides by fire, and has more fire-tubes than the other cylinders, it is the hottest cylinder of the entire number, and becomes in effect a superheater for the steam generated in the outer cylinders and supplied to it; hence I obtain dry hot steam for the engine.

What I claim as my invention is—

1. The combination, with the main cylinders A and B and conical joining section C, of the multiple cylinders $D D'$, &c., located in said main cylinder A and having fire-tubes and drop water-legs or pendent tubes, which extend down into said main cylinder B, the latter forming a fire or heating chamber, substantially as shown and described.

2. In a steam boiler or generator, the combination, with a surrounding casing, of a central cylinder and other cylinders surrounding it,

each of said surrounding cylinders having fire-flues and drop water-tubes and having steam and water connections with the central cylinder, the latter having fire-flues and a steam-
5 exit, substantially as shown and described.

3. In a steam boiler or generator, the combination, with an incasing-shell, of multiple cylinders located in one section or half thereof and having water legs or pipes extending into
10 the other section or half, said cylinders being arranged with one in the center and the oth-

ers surrounding and communicating with it, said cylinders having fire-tubes, substantially as shown and described.

In testimony that I claim the foregoing I 15
have hereunto set my hand this 8th day of October, 1886.

LUCIUS D. COPELAND.

Witnesses:

WILL H. POWELL,
R. DALE SPARHAWK.