

No. 724,967.

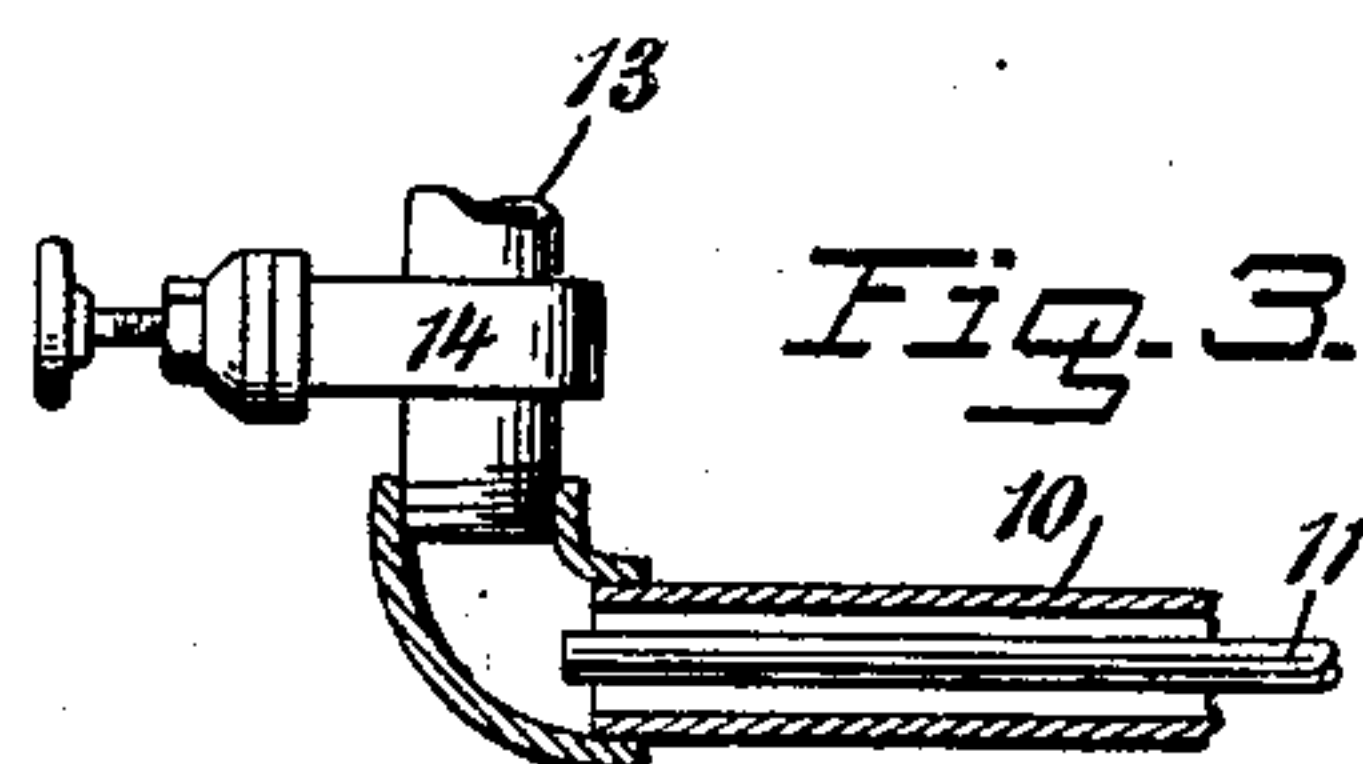
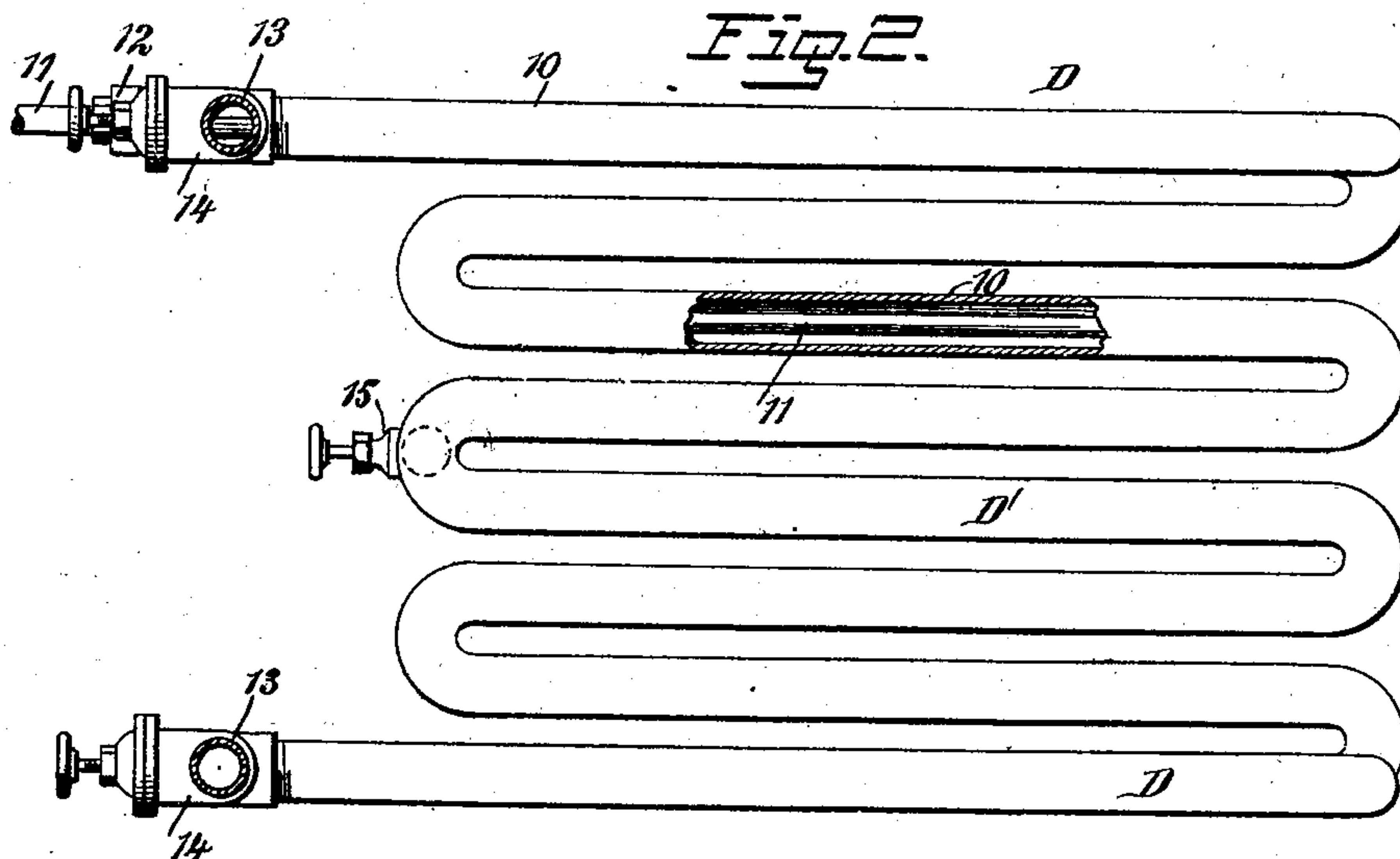
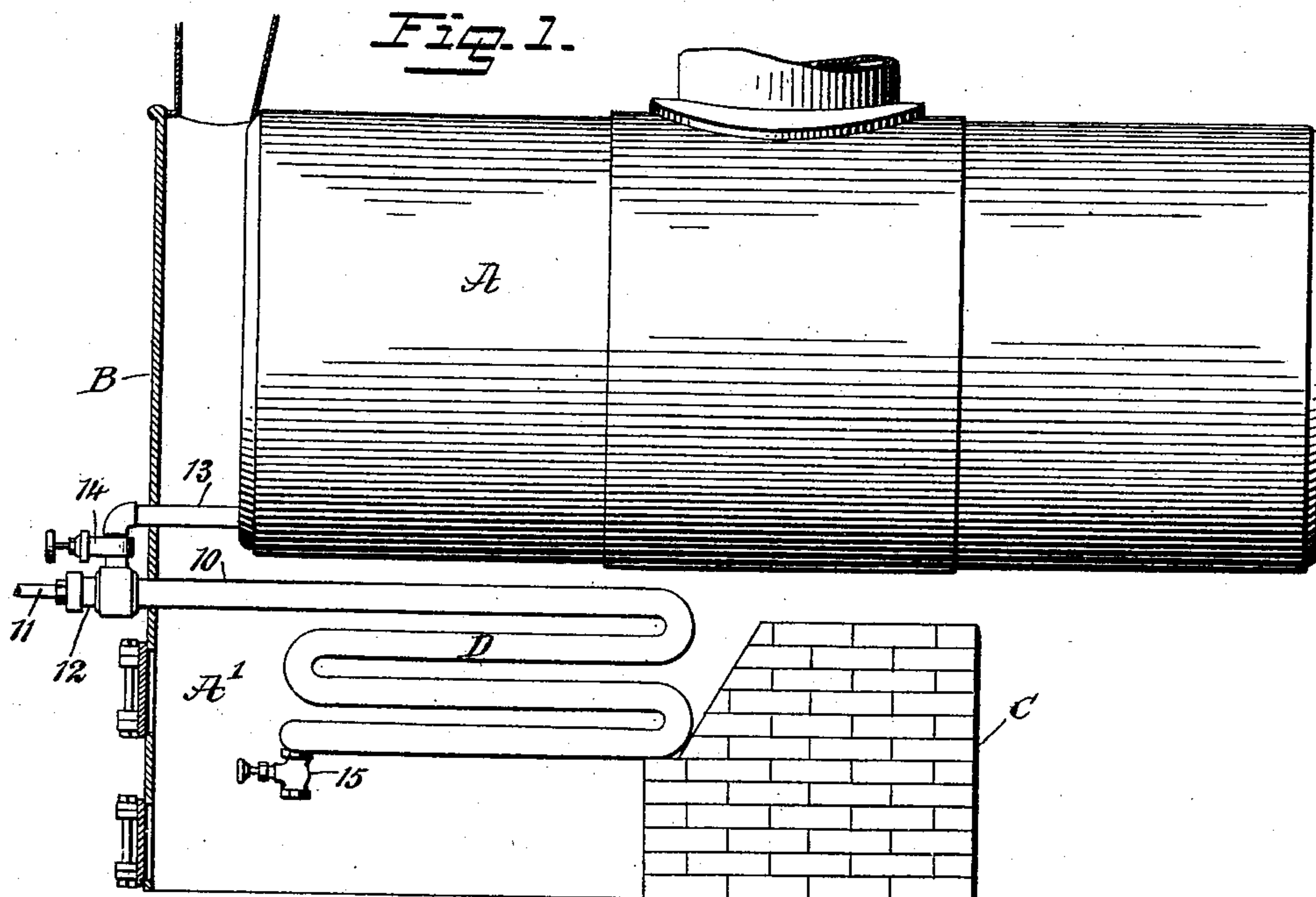
PATENTED APR. 7, 1903.

C. G. TAYLOR.
FEED WATER HEATER FOR BOILERS.

APPLICATION FILED APR. 23, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

James F. Duhamel,
J. A. Schenck,

INVENTOR

Charles Gilbert Taylor

BY

Mumford

ATTORNEYS

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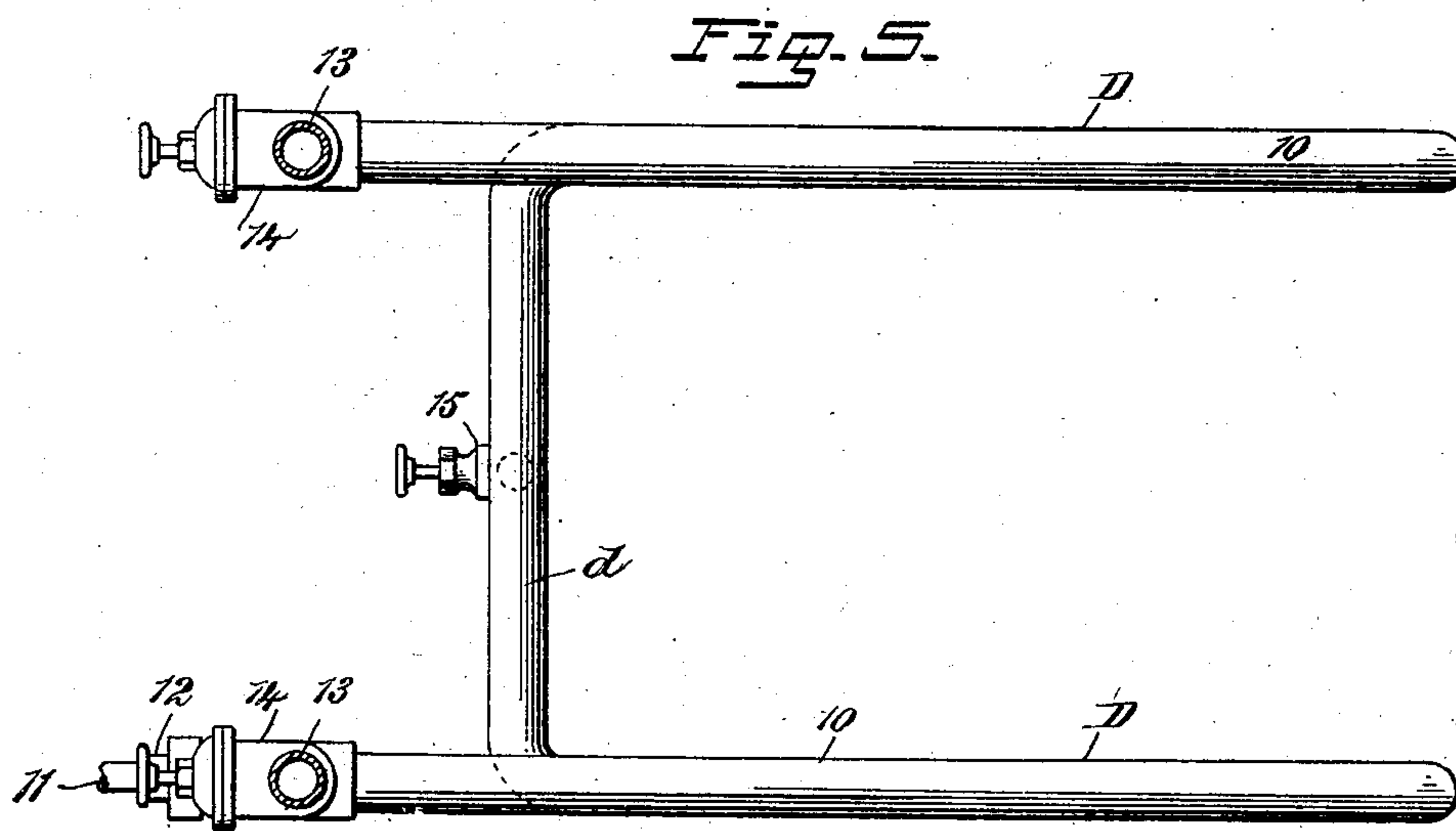
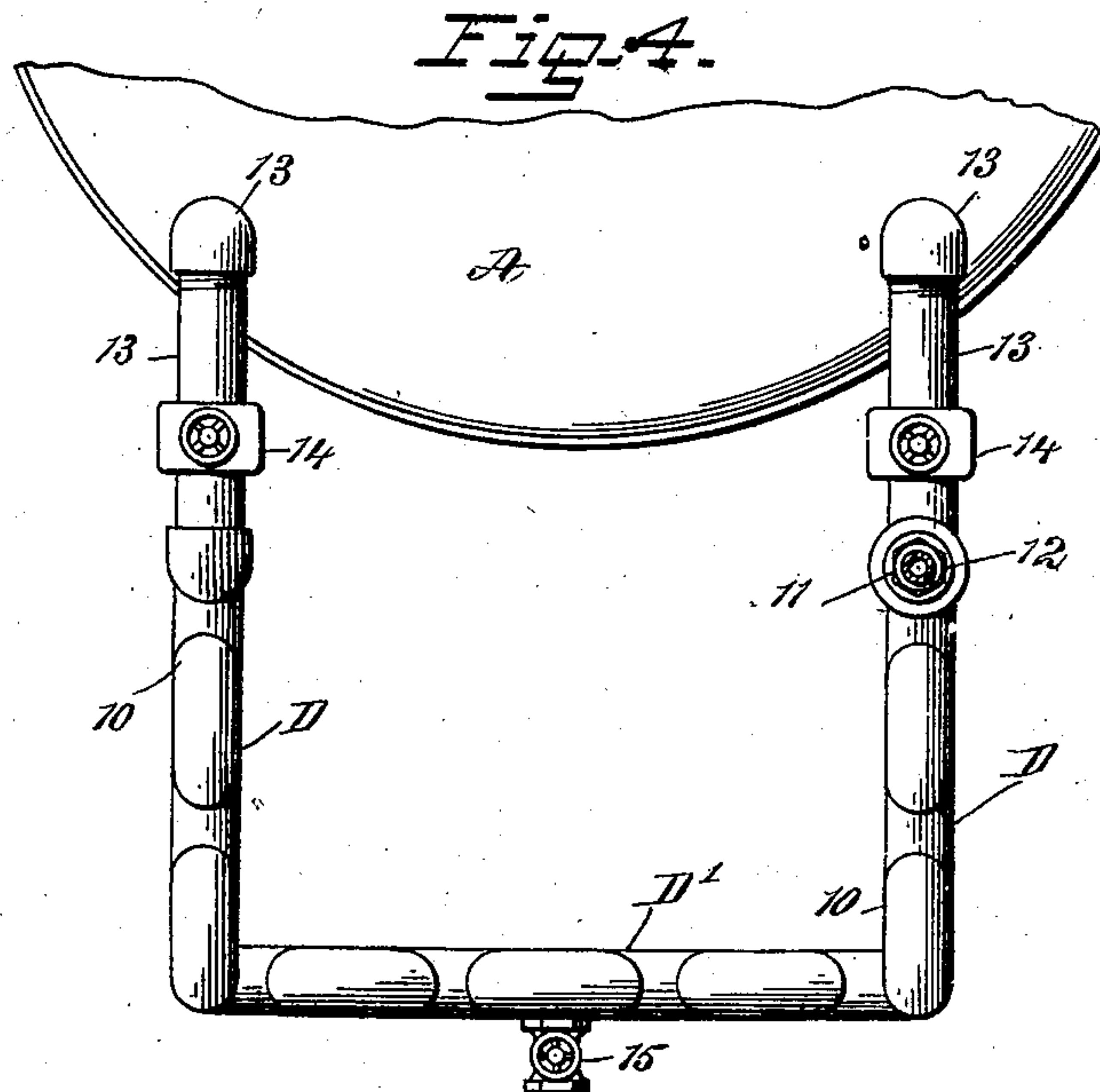
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[Signature]

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UNITED STATES PATENT OFFICE.

CHARLES GILBERT TAYLOR, OF FARMINGTON, WASHINGTON.

FEED-WATER HEATER FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 724,967, dated April 7, 1903.

Application filed April 23, 1902. Serial No. 104,269. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GILBERT TAYLOR, a citizen of the United States, and a resident of Farmington, in the county of Whitman and State of Washington, have invented a new and Improved Feed-Water Heater for Boilers, of which the following is a full, clear, and exact description.

The purpose of my invention is to provide a feed-water heater for boilers so constructed that it is utilized as the sides and grate of a furnace except where a rocker-grate is required, when the device is used as the sides of the furnace only, and the sides are connected at a point beneath the rocker-grate.

Another purpose of the invention is to provide a feed-water heater for boilers consisting of double series of tubing, the inside pipe being for feed-water to the boiler and the outside pipe being arranged and adapted to allow the free circulation of water from and to the boiler, whereby the heater when used as the grate and sides of a furnace is exposed to a great heat, adding materially to the heating-surface of a boiler, and the feed-water is heated to a high degree by what would otherwise be waste heat.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the boiler and feed-water heater and a section through the front casing and furnace. Fig. 2 is a sectional plan of the feed-water heater when used as a grate and side of a furnace. Fig. 3 is a sectional view of that portion of the water-circulating pipe where the feed-water pipe ends, the latter pipe appearing in side elevation. Fig. 4 is a front elevation of the device shown in Fig. 2 and a front elevation of a boiler to which it is applied; and Fig. 5 is a plan view of the device, illustrating its construction when used in connection with a rocking grate and as the sides of the furnace only.

A represents the boiler, B the front casing-wall, and C the back wall of the furnace.

In the construction of both forms of the device an outer and an inner pipe 10 and 11 are provided, the outer pipe 10 being the water-circulating pipe and the inner pipe 11 the feed-water pipe. Said pipes are bent and provided with return-bends to form opposing coils D, in which one member of a coil is below the other, as is shown in Figs. 1 and 4, and a connection between the pipes of the side coils. The side coils D are to constitute the side walls of the furnace A' for the boiler and rest at their rear portions upon the back wall C of the furnace, as is shown in Fig. 1, and supports of any approved character may be provided for the forward portions of the coils D, if found necessary. Where a rocker-grate is not required, the side coils D are connected by intermediate horizontal coils D', as is shown in Figs. 2 and 4, which horizontal coils constitute the grate of the furnace; but where a rocker-grate is employed the side coils D are connected by transverse pipes d, one within the other, extending beneath the grate, preferably at its forward portion, as is shown in Fig. 5.

The feed-water pipe 11 is brought from any source of water-supply and is made to enter the forward end of the upper member of one of the side coils D through a suitable stuffing-box 12 and extends throughout the length of the outer or water-circulating pipe 10 of the coil or coils and connecting-section d, preferably terminating near the outer end of the upper member of the opposite side coil D, as is shown in Fig. 3; but the feed-water pipe 11 may terminate at any desired point in the length of the water-circulating pipe 10.

At the outer end portion of the upper member of each side coil a branch pipe 13 is connected by any well-known means, and these branch pipes 13 enter the water-chamber of the boiler A at its front, as is shown in Figs. 1 and 4. Straightway valves 14 are located in the branch pipes 13, preferably where they connect with the coils D, and a blow-off valve 15 is located in the water-circulating pipe 10 either at a member of the horizontal coil D' or in the connecting-section d. By means of the straightway valve 14 in the heater device the circulation of the water may be shut off at any time, and by opening the blow-off

valve 15 and closing either of the straight-way valves 14 each side of the heater may be blown out separately.

The size of the pipe used is to be governed
5 by the capacity of the boiler, and the heater may be used upon either stationary or portable boilers.

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

1. A feed-water heater for boilers, consisting of a double series of tubing adapted to be located in the furnace of a boiler, the inside tube being for supplying feed-water to the
15 boiler and the outside tube for adding to the free circulation of water in the boiler, a pipe for connecting the upper ends of the outside or circulating tube with the water-space in the boiler, and a cut-off valve in said pipe.

20 2. A feed-water heater for boilers, consisting of a double series of tubing adapted to be located in the furnace of the boiler, the outside tube having means for connecting its ends with the water-space of the boiler, said
25 outside tube being a water-circulating tube for the boiler, the inner tube being a feed-water tube for the boiler, the said inner or feed-water tube entering the circulating-tube near one end, and terminating within the said
30 circulating-tube between its ends, and a cut-off valve in the upper end of the outer tube

at a point between the termination of the small tube and the boiler.

3. A feed-water heater for boilers, consisting of a double series of tubes, the outer tube
35 having means for connecting its ends with the water-space of a boiler, the said outer tube being the water-circulating tube for the boiler and the inner tube being the feed-water tube for said boiler, entering the circulating-tube near one end and terminating
40 within said circulating-tube between its ends, the said double tubing being bent to form side coils, one member of which is below the other, and a horizontal coil connecting the
45 side coils, the side coils being adapted as the side walls of a boiler-furnace, and the horizontal coils being adapted as a grate for such furnace, cut-off valves located between the
50 ends of the upper members of the side coils and the connection of the circulating-tube with the boiler, and a blow-off valve located in a member of the horizontal coil of the circulating-tube, for the purpose described.

In testimony whereof I have signed my
55 name to this specification in the presence of two subscribing witnesses.

CHARLES GILBERT TAYLOR.

Witnesses:

W. L. MILES,

J. BLICKENDERFER.