

No. 751,453.

PATENTED FEB. 9, 1904.

J. C. BROMLEY.
BOILER.

APPLICATION FILED JUNE 27, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

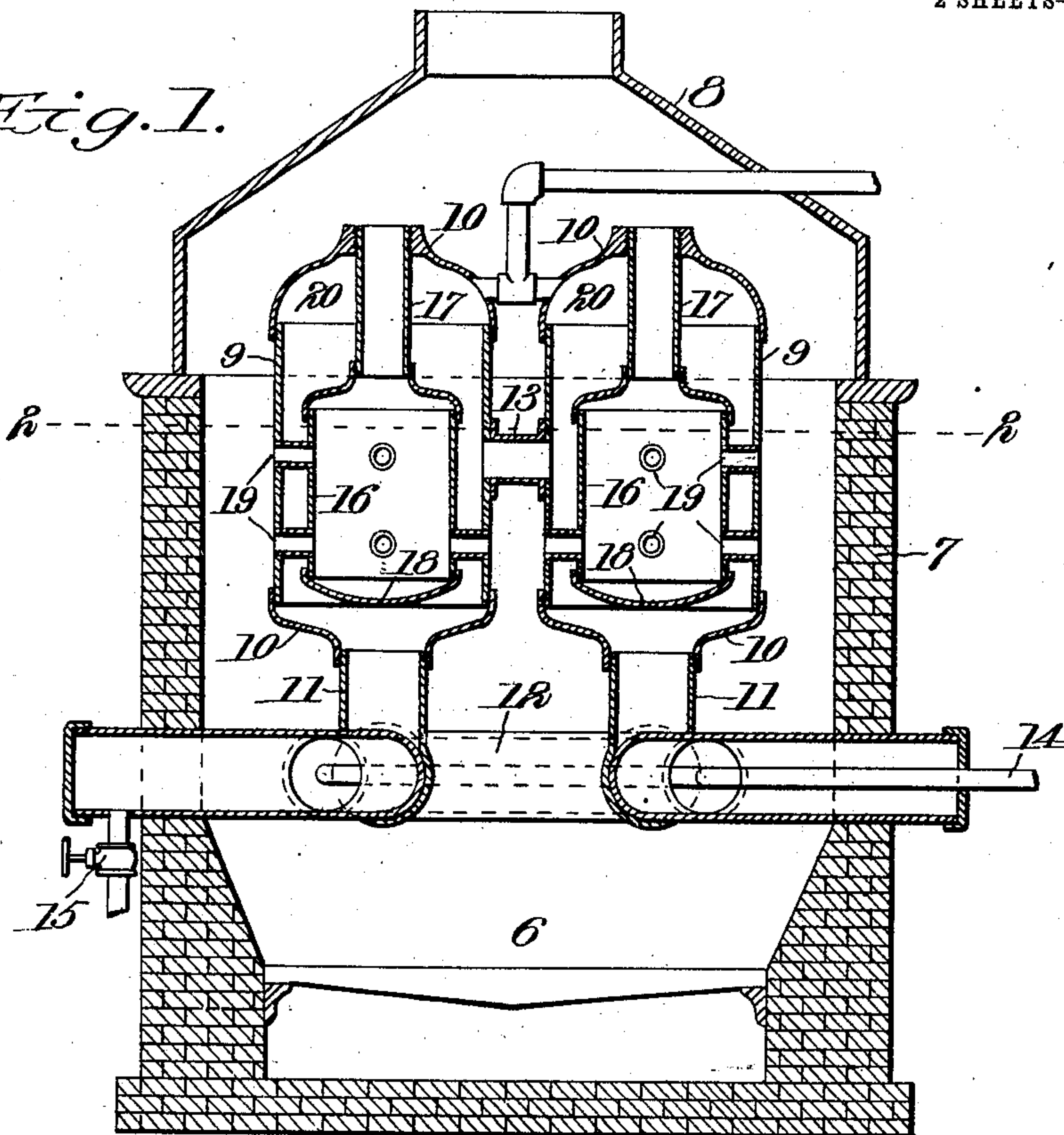
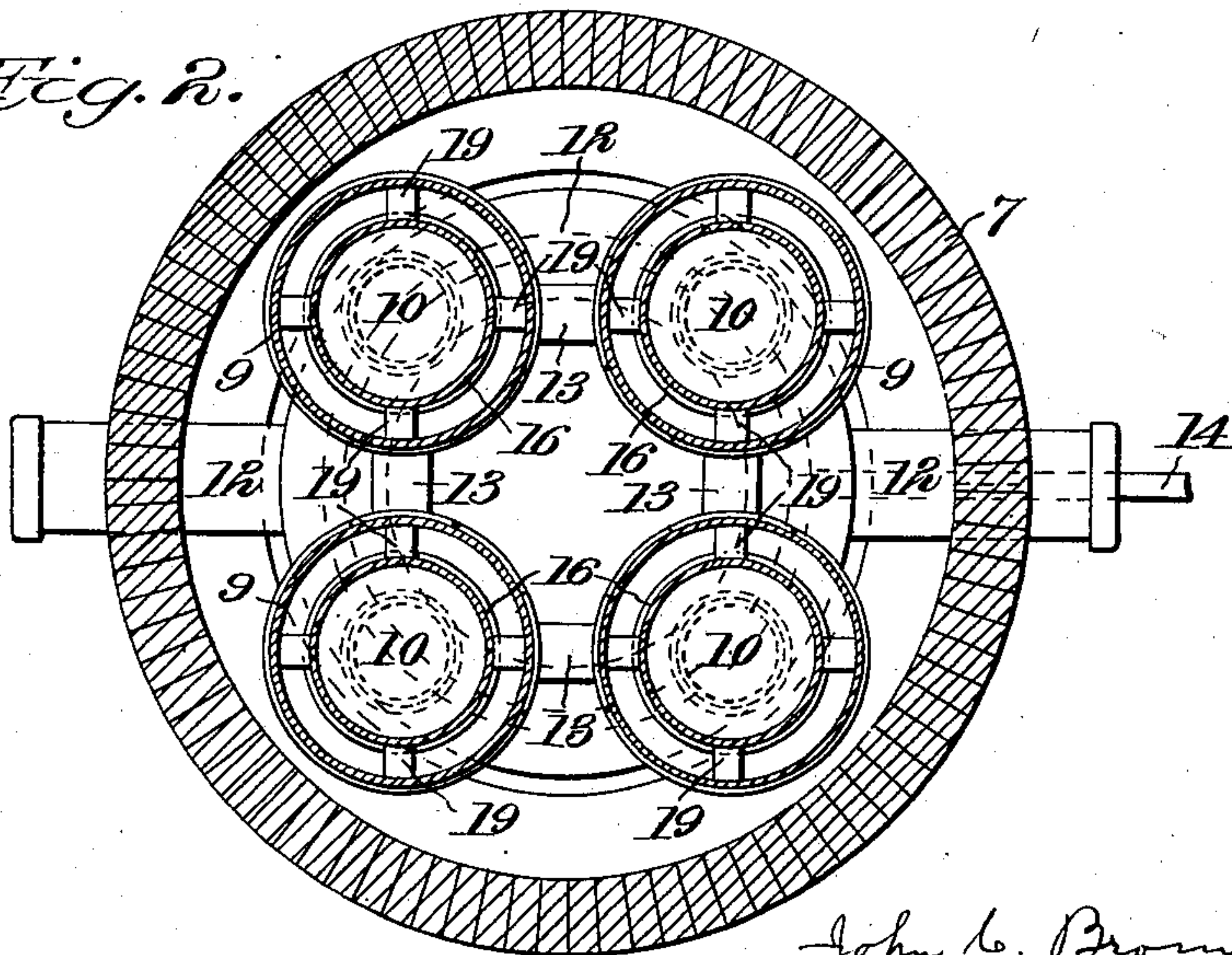


Fig. 2.



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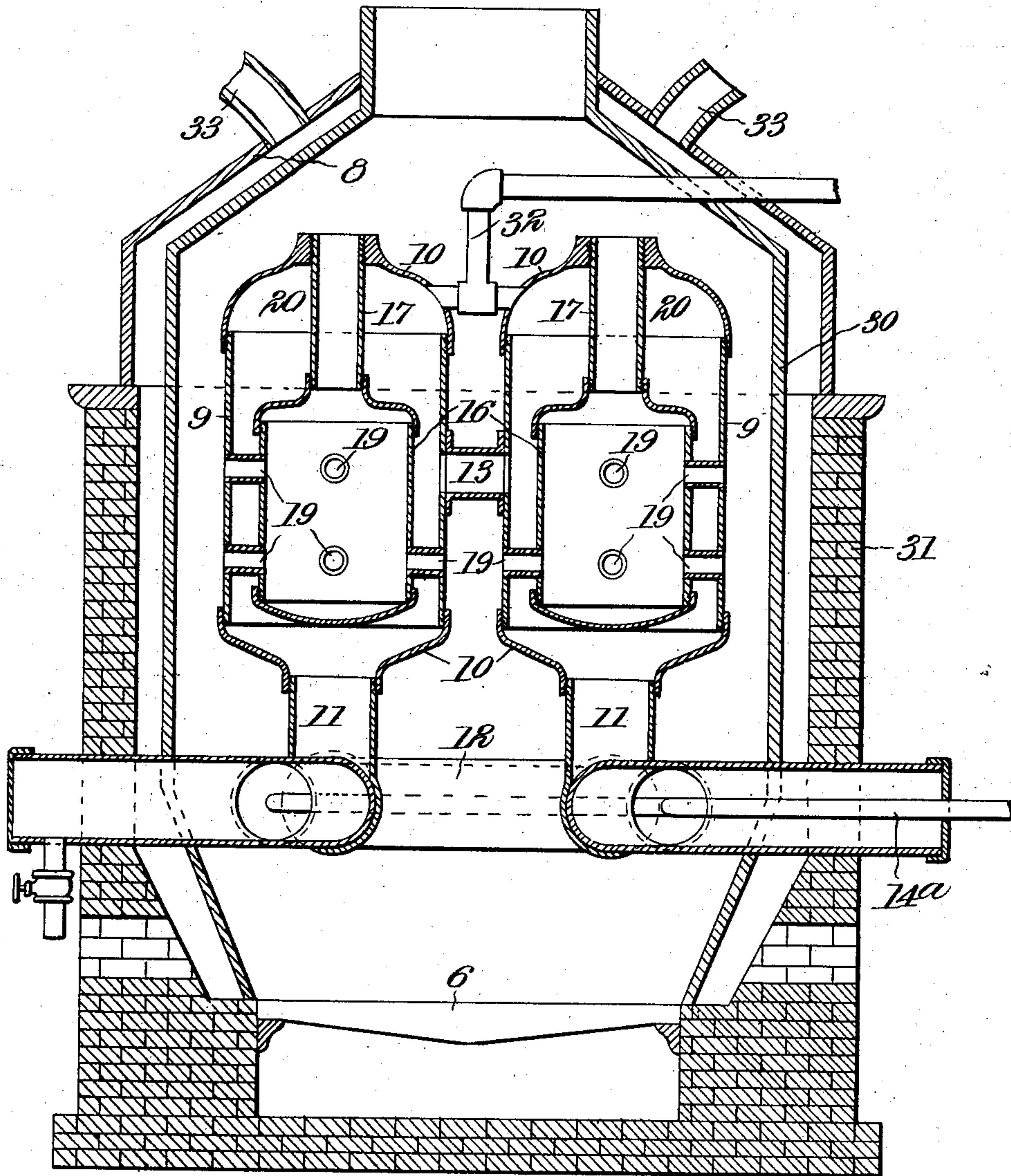
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2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN C. BROMLEY, OF ROCK ISLAND, ILLINOIS.

BOILER.

SPECIFICATION forming part of Letters Patent No. 751,453, dated February 9, 1904.

Application filed June 27, 1903. Serial No. 163,428. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BROMLEY, a citizen of the United States, residing at Rock Island, in the county of Rock Island and State of Illinois, have invented new and useful Improvements in Boilers, of which the following is a specification.

This invention relates particularly to boilers for generating steam, but is not confined thereto, since it may be applied to hot-water heaters and to hot-water heating systems.

The object of the invention is to provide a construction having improvements with respect to efficiency of generating or heating for the amount of fuel consumed.

A further object of the invention is to construct a sectional boiler which may be repaired with facility and small cost.

A further object of the invention is to construct a quick-acting steam-boiler by exposing a comparatively small quantity of water to the heat of the furnace at one time.

The construction invented also has advantages with respect to the deposition and removal of scale from the interior of the boiler, as will be more fully pointed out hereinafter.

In the accompanying drawings, Figure 1 is a vertical section of a steam-boiler constructed in accordance with the invention. Fig. 2 is a horizontal section thereof on the line 2 2 of Fig. 1, and Fig. 3 is a vertical section of the invention as applied to a hot-water heater.

Referring specifically to the drawings, the furnace is indicated at 6 and the boiler-casing at 7, preferably formed of brick, with a sheet iron or metal top or cover 8. Within the casing are several connecting boiler-chambers of similar construction, as will be more fully hereinafter specified. There may be any desired number of these individual chambers having suitable connections to form a battery. Each consists of a cylindrical shell 9, closed at both ends by reducing-caps 10, the lower of which connects by a tube 11 with the horizontal tube 12, which extends across the fire-box. The chambers 9 stand vertically side by side within the boiler-casing and are connected by a circulation-pipe 13. Water is

supplied to the tube 12 from a pipe 14, and a blow-off cock is indicated at 15.

Depending from the upper head 10 within the shell or chamber 9 is a displacement shell or chamber 16, having a tubular connection 17 with the head 10, whereby it is supported. This displacement-chamber is closed at the bottom by a cap 18 and receives the products of combustion from the fire-box through a number of short flues 19, which extend through the shells of both chambers. The displacement-chambers are set low in the water-cylinders, so that comparatively large steam-spaces 20 are left at the top of the cylinders, forming steam-domes. The water-line is at or about the top of the brick casing, so that the boilers are submerged in the fire-box as high as the water-line, preventing contraction from sudden admission of cold air, so detrimental to partly-submerged boilers. This also insures even and efficient heating. The dome or cover 8 retains sufficient heat to prevent condensation of the steam of the steam-domes 20.

The displacement-chambers 16 within the water-chambers 9 have the effect of giving a great amount of heating-surface to the least practical amount of water. The film or sheet of water between the inner and outer shells will allow the rapid generation of steam. Furthermore, inasmuch as the inner or displacement chambers are cooler than the outer shells the sediment or scale naturally adheres to the former, which being least exposed to the fire cuts little figure. By removal of the headers 10 the inner chambers may be readily taken out and cleaned whenever required. The sectional construction of the boiler also permits convenient and cheap duplication and repair.

When used in connection with a hot-water heating system, as illustrated in Fig. 3, the boiler-sections are inclosed in a metal shell 30, which in turn may be jacketed within a brick wall 31 and spaced therefrom. The hot-water connection or outlet is then from the top of the boiler, as indicated at 32, and the return or cold-water connection at 14^a. The air heated

between the brick jacket and the iron shell may be used for hot-air heating purposes through service-pipes 33. This produces a very efficient and economical hot-water heating boiler and system.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a furnace, of a feeding-tube within the same, a vertical water-chamber connected at the bottom to the tube, and a displacement-chamber depending within the water-chamber and having a reduced neck at the top, forming an enlarged steam-space at the upper end of the water-chamber.

2. The combination with a furnace, of several individual vertical water-cylinders therein, having removable heads at both ends, supply and circulation pipes connecting the cylinders, and a displacement-chamber within each cylinder, having a reduced tubular connection through the top head.

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

JOHN C. BROMLEY.

Witnesses:

T. J. PAISLEY,
F. L. OHMERT.