

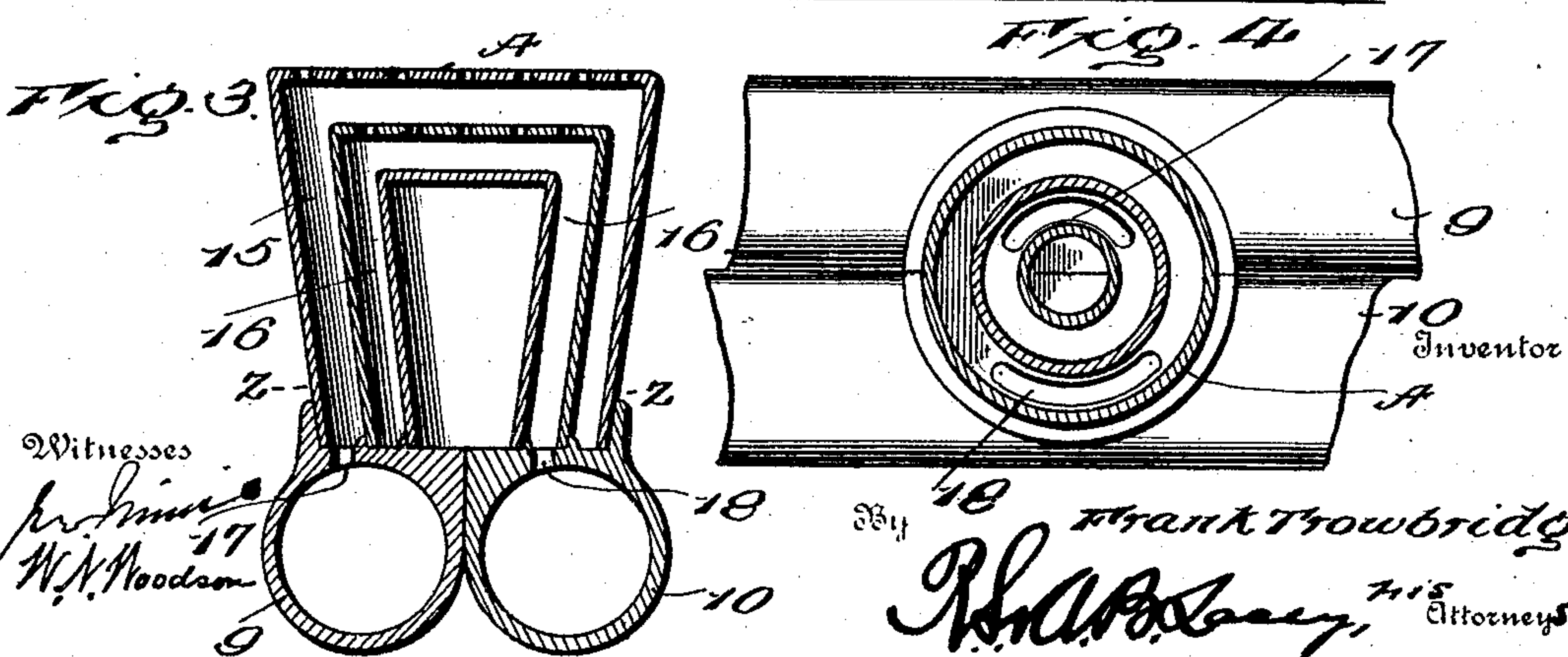
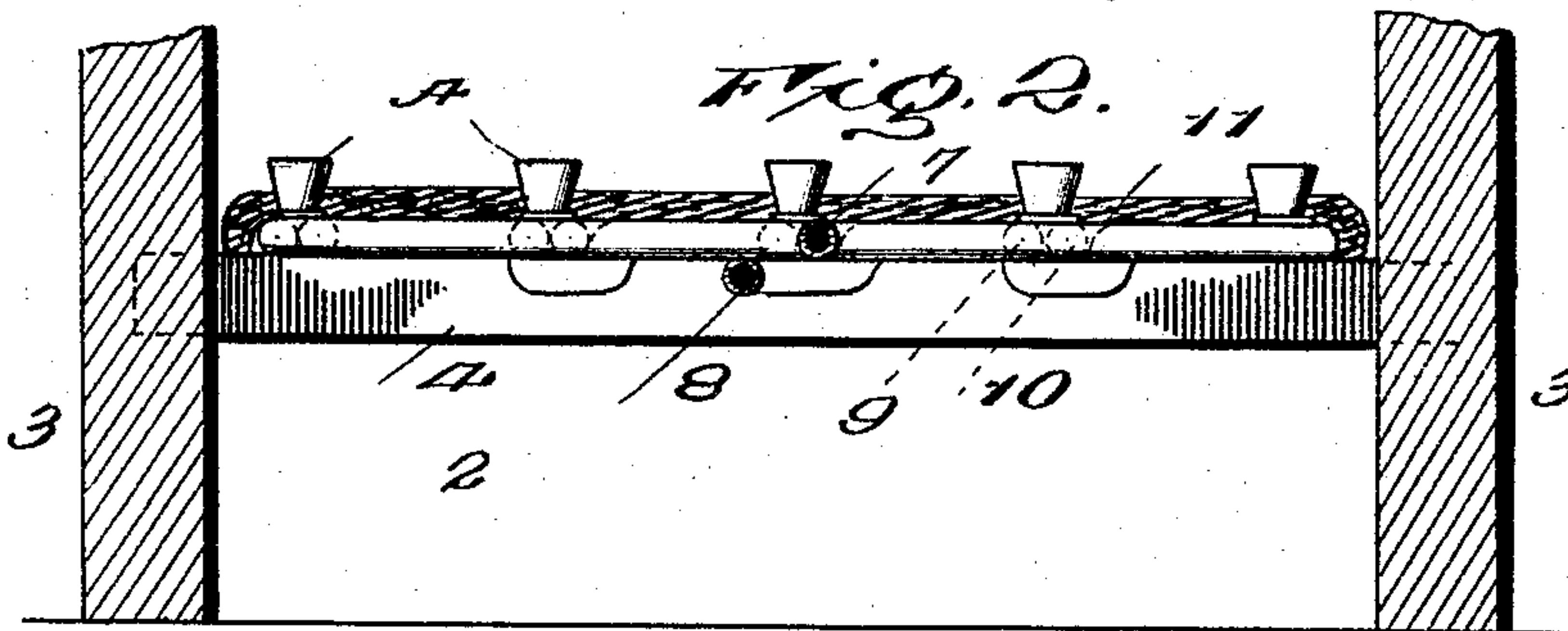
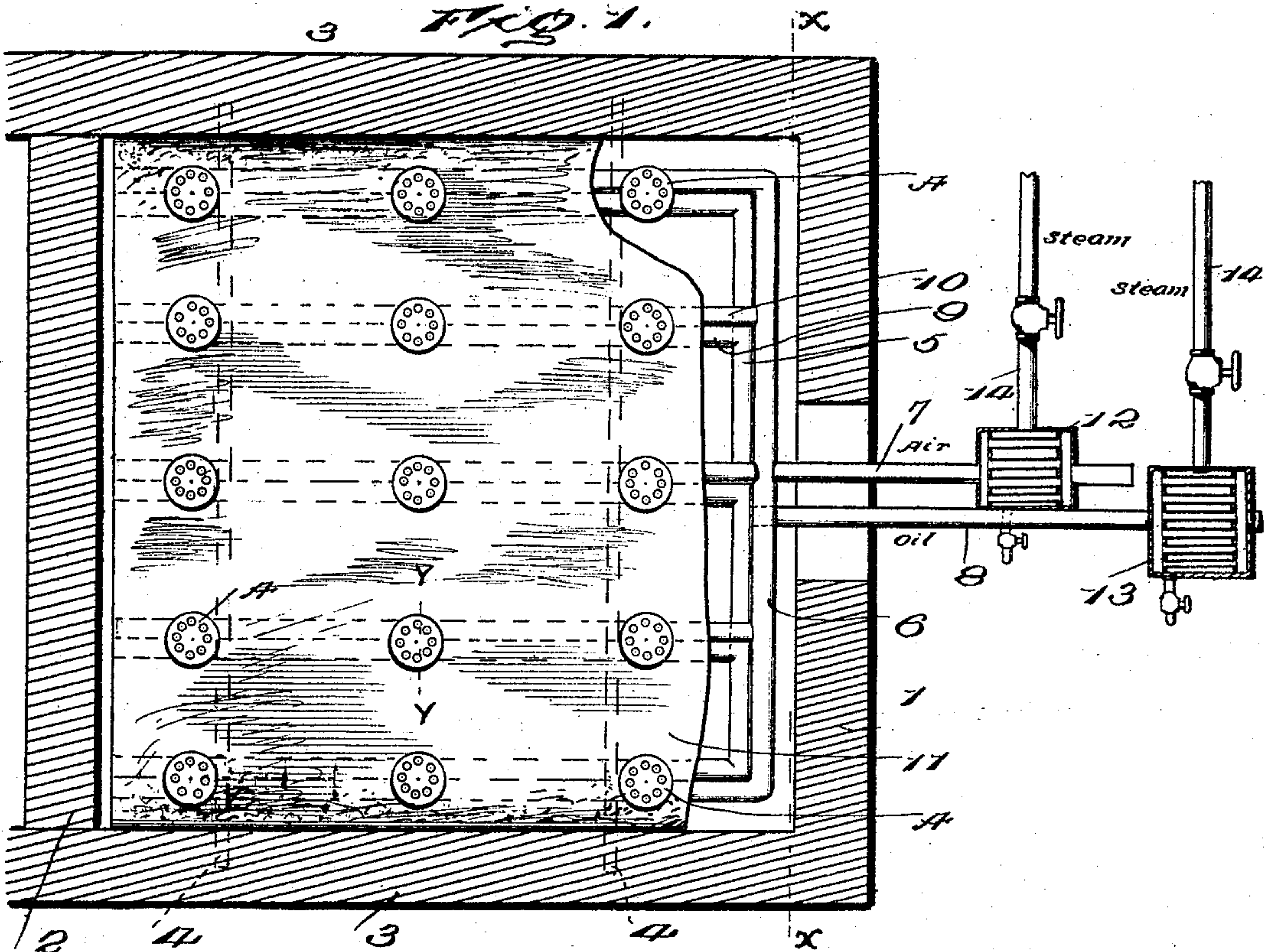
No. 772,263.

PATENTED OCT. 11, 1904.

F. TROWBRIDGE.
FUEL OIL BURNER.

APPLICATION FILED FEB. 1, 1904.

NO MODEL.



UNITED STATES PATENT OFFICE.

FRANK TROWBRIDGE, OF FOND DU LAC, WISCONSIN.

FUEL-OIL BURNER.

SPECIFICATION forming part of Letters Patent No. 772,263, dated October 11, 1904.

Application filed February 1, 1904. Serial No. 191,560. (No model.)

To all whom it may concern:

Be it known that I, FRANK TROWBRIDGE, a citizen of the United States, residing at Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented certain new and useful Improvements in Fuel-Oil Burners, of which the following is a specification.

This invention has relation to hydrocarbon-burners particularly designed for furnaces of steam-boilers, although adapted for use in connection with furnaces for any purpose and design, the essential feature being to prevent the giving off of free carbon and to utilize the liquid fuel to the best possible advantage, whereby a maximum percentage of units of heat is derived from a given quantity of oil.

The invention consists, essentially, of the novel features, details of construction, and combinations of parts which hereinafter will be more particularly set forth, illustrated, and finally claimed.

In the drawings hereto attached and forming a part of the specification, Figure 1 is a horizontal section of the fire-box of a furnace, showing the application of the invention. Fig. 2 is a transverse section of the fire-box on the line X X of Fig. 1 looking to the rear. Fig. 3 is a section of a burner and supply-pipes on the line Y Y of Fig. 1, showing the parts on a larger scale. Fig. 4 is a plan section on the line Z Z of Fig. 3.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The fire-box of the furnace comprises the front wall 1, bridge-wall 2, and side walls 3. Bars 4 are supported at their ends in the side walls 3 and extend across the space formed therebetween. The burners and supply-pipes rest upon the transverse bars 4 and may be provided in any number according to the size of the furnace and particular work for which the furnace is designed.

Headers 5 and 6 are arranged adjacent to the front wall 1 and are connected with, respectively, a source of air and oil supply by means of pipes 7 and 8, said mediums being forced through the pipes by suitable pressure. Companion pipes 9 and 10 connect with the

respective headers 5 and 6 and proceed therefrom about at a right angle and extend lengthwise of the fire-box and are spaced apart a determinate distance. Each pair of pipes 9 and 10 is provided with a series of burners A, which are in communication with both pipes of the respective pairs, so as to receive a charge of oil and air. These burners will be described in detail hereinafter. The pipes 9 and 10 extend side by side in parallel relation, and the spaces between adjacent pairs of pipes are closed by tiles 11, of asbestos, fire-clay, or other refractory material. By closing the spaces between the pairs of pipes the heat is concentrated and a maximum percentage is utilized for effective work.

The air in its passage through the pipe 7 is heated, and for this purpose a heater 12 of any construction is provided. The oil in transit through the pipe 8 is likewise heated, and to effect this result the heater 13 is located in the length of the pipe. While the heaters 12 and 13 may be of any variety adapted to attain the desired result, it is preferred to have the same consist of drums to which steam is supplied by pipes 14 from the boiler or other steam-generator, the water of condensation being drawn off or permitted to escape through petcocks applied thereto.

The burners A embody concentric chambers 15 and 16, which are in communication with the respective pipes 9 and 10 through openings 17 and 18. The tops of the chambers are perforated, as indicated most clearly in Fig. 3, and the vaporized hydrocarbon issuing from the chamber 16 commingles with the air in the upper portion of the chamber 15 and passes through the openings in the top of the chamber 15 and is burned. The burners, however, may be of any construction and connected to the pipes 9 and 10 in any manner so long as they receive a supply of air and oil therefrom and effect a mixture of the same prior to issuance at the opening to be consumed.

Having thus described the invention, what is claimed as new is—

1. In a fuel-oil burner, the combination of companion supply-pipes connected with a source of air and oil supply, and a burner com-

prising concentric chambers having independent connection with the respective pipes, the tops of said chambers being perforated and the space formed between the perforated tops
5 constituting a mixing-chamber, substantially as set forth.

2. In a furnace, and in combination with the fire-box, juxtaposed headers arranged adjacent to a wall of the fire-box and having connection with a source of air and oil supply,
10 pairs of pipes projected from the headers across the space between opposite walls of the fire-box, burners in the length of the pipes

and having independent connection therewith, each of the burners having a mixing-compartment in its upper portion, and a heater applied to the supply-pipes for heating the air and oil on their way to the respective headers, substantially as specified. 15

In testimony whereof I affix my signature in presence of two witnesses. 20

FRANK TROWBRIDGE. [L. s.]

Witnesses:

M. M. ANDERSON,
ELVA L. ANDERSON.