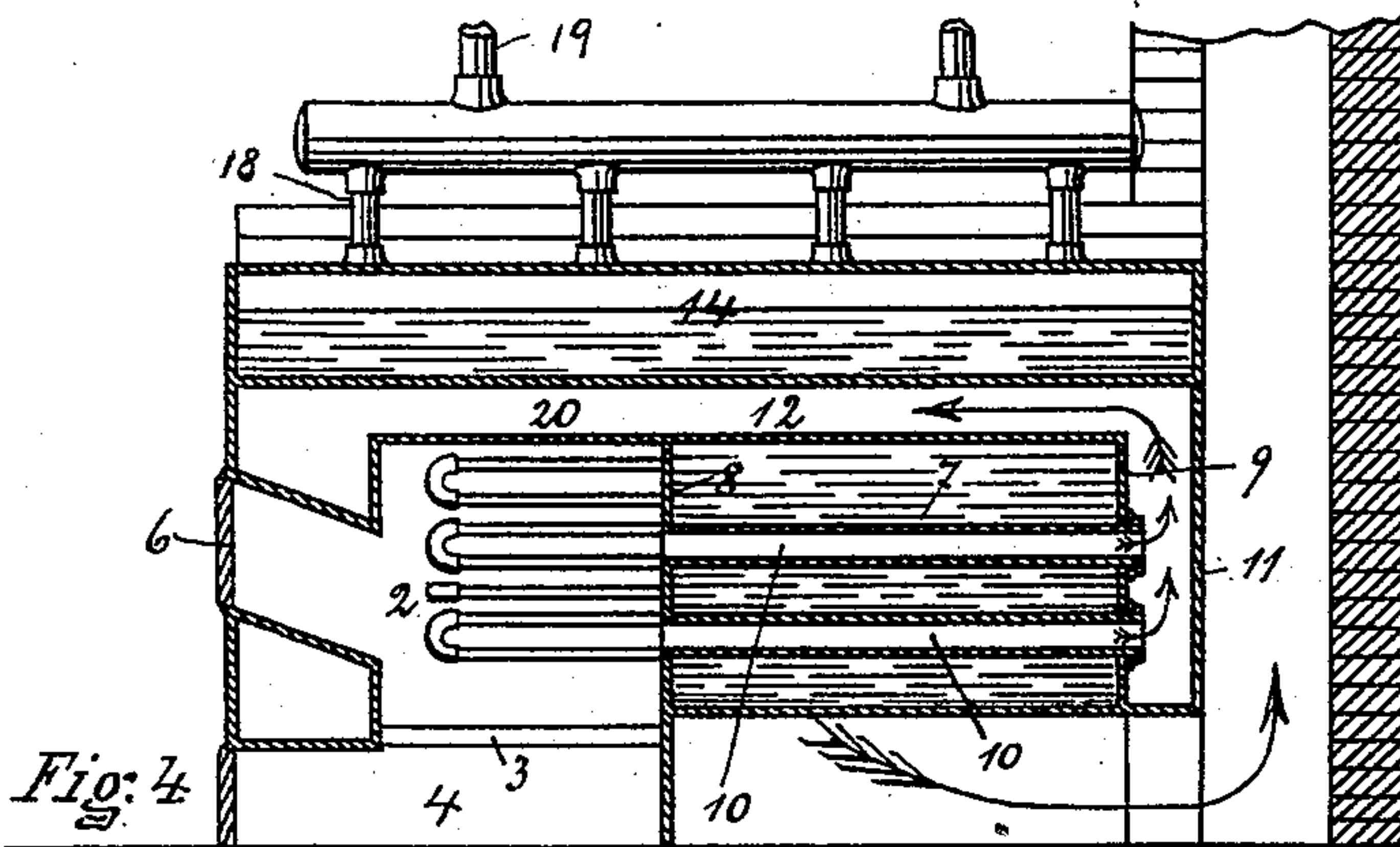
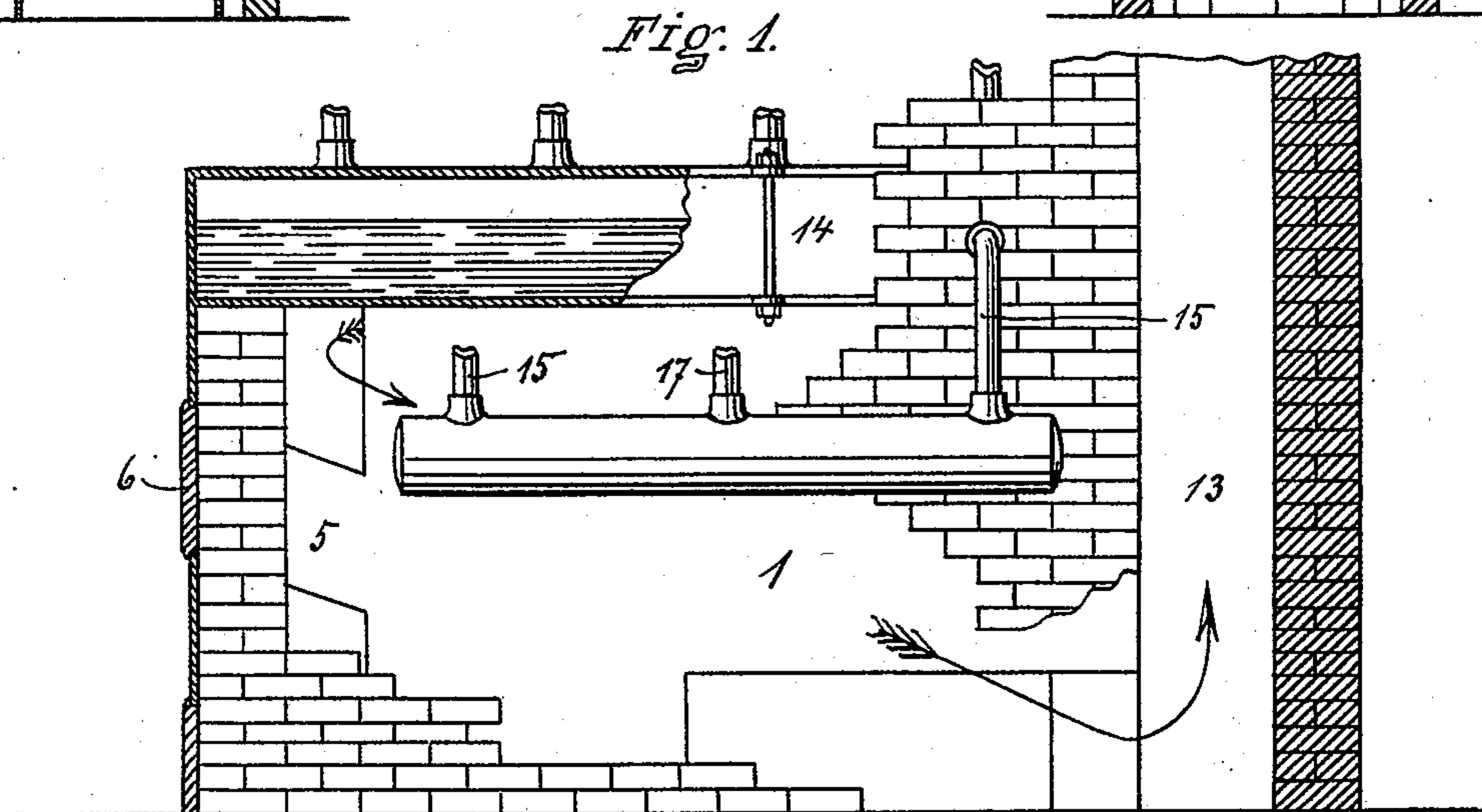
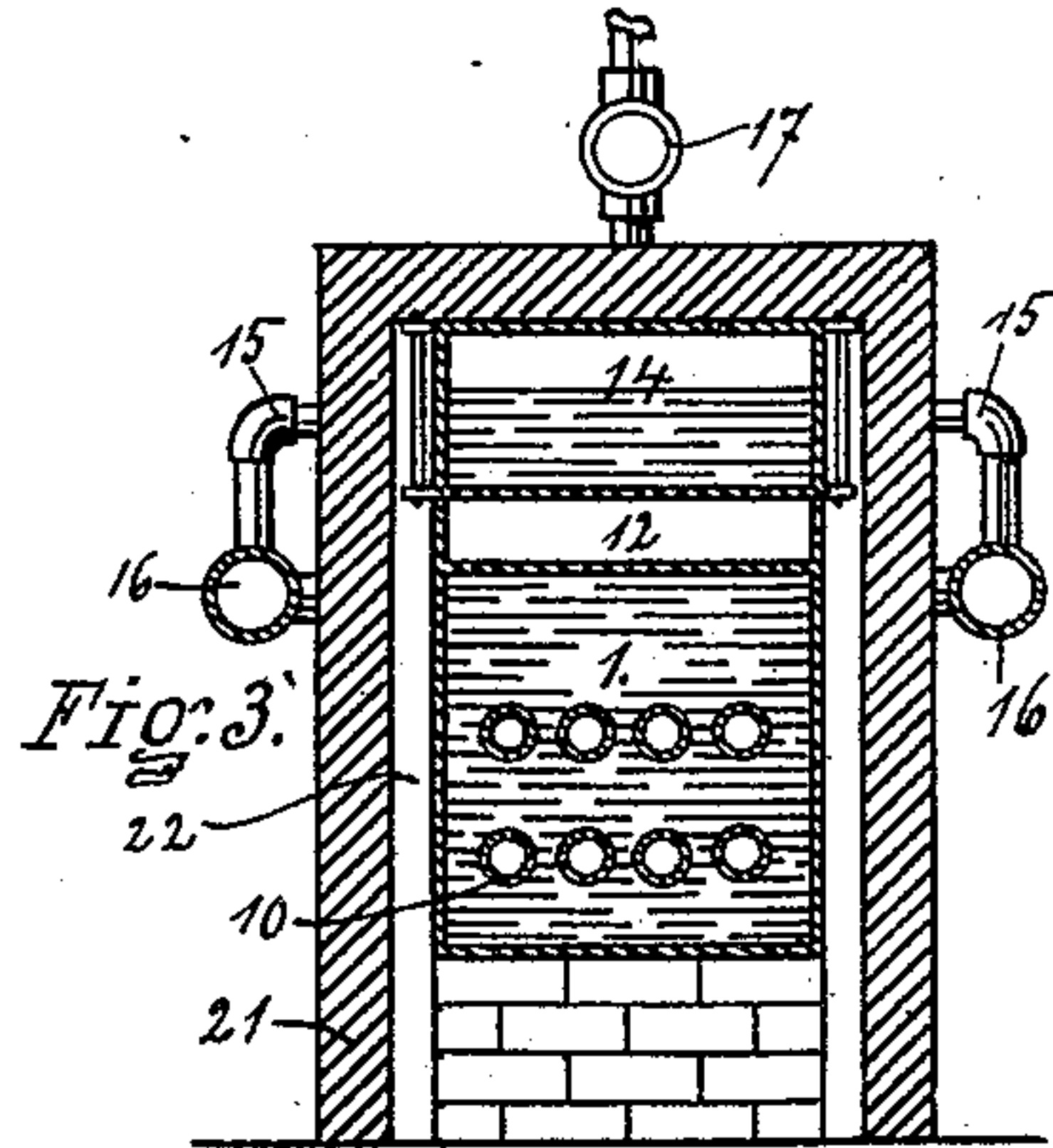
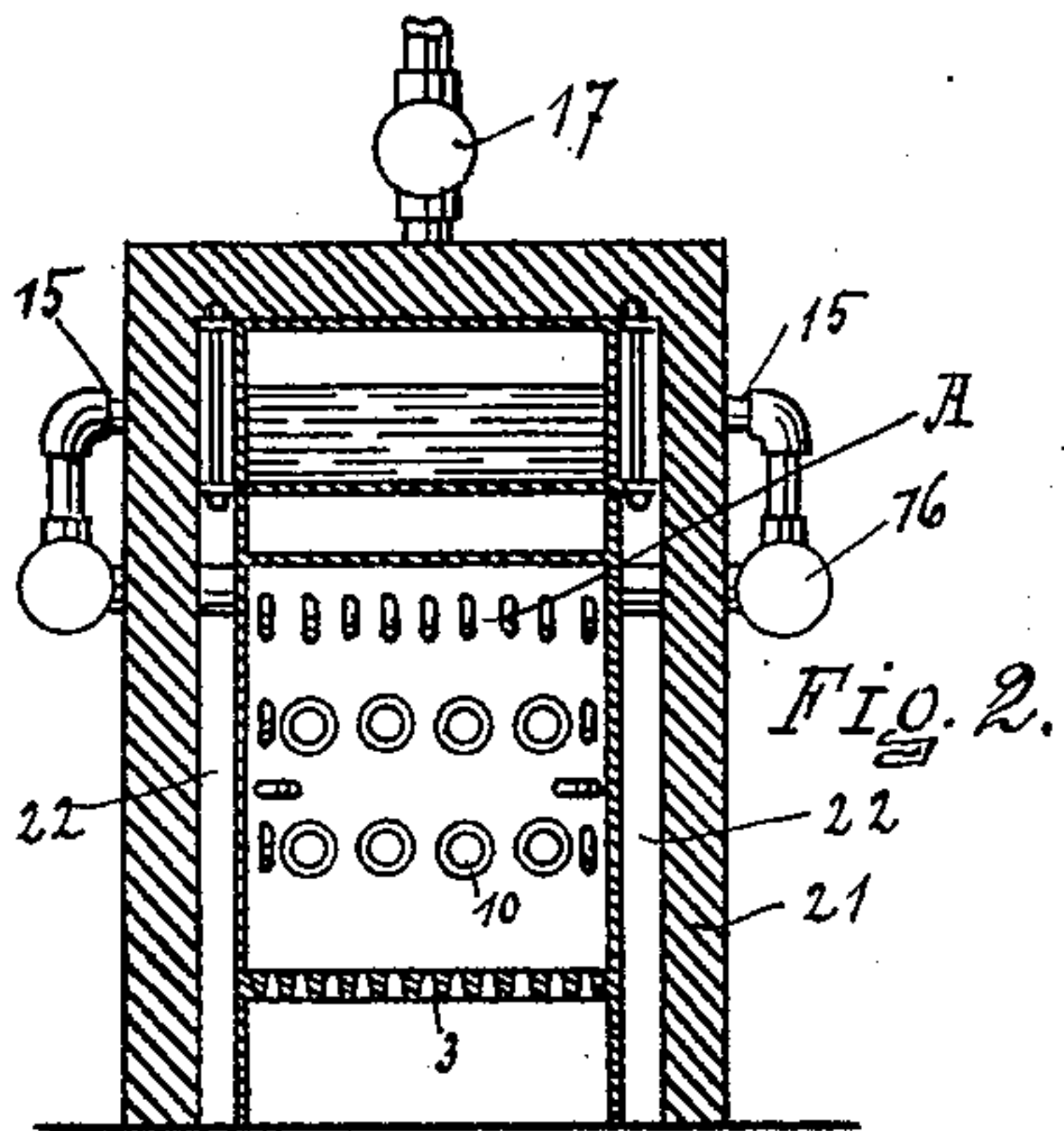


(No Model.)

P. J. CROUSE.  
HEATER.

No. 539,420.

Patented May 21, 1895.



WITNESSES.  
Rich. A. George.  
Arthur Savage

INVENTOR.  
PETER J. CROUSE  
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ATTORNEYS.



# UNITED STATES PATENT OFFICE.

PETER J. CROUSE, OF UTICA, NEW YORK, ASSIGNOR OF ONE-HALF TO  
ELLSWORTH W. MILLGATE, OF SAME PLACE.

## HEATER.

SPECIFICATION forming part of Letters Patent No. 539,420, dated May 21, 1895.

Application filed January 19, 1894. Serial No. 497,387. (No model.)

*To all whom it may concern:*

Be it known that I, PETER J. CROUSE, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Heaters; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form part of this specification.

My invention relates to improvements in heaters adapted for water or steam heating. In the drawings which accompany and form a part of this specification, and in which similar letters and figures of reference refer to corresponding parts in the several views, Figure 1 shows in side elevation, partially in section and with parts broken out, my improved heater arranged as a steam-heater. Fig. 2 shows a sectional view adjacent to the front end, showing the interior of the fire-box. Fig. 3 shows a cross-section adjacent to the rear end, showing in the cross-section the flues and water and steam chambers. Fig. 4 shows a longitudinal section of the device.

Referring to the figures and letters of reference in a more particular description of the device, 1 indicates the body portion of the heater which is in general outline from the side of a locomotive boiler shape and is rectangular in cross-section through the fire-box portion and the boiler portion of the device.

The body portion is provided with a chamber 2 for containing the fire and known as the fire-box, in the bottom of which is provided the grate 3, and below this the ash-pit 4. The fire-box is provided with an inclined feed section 5 terminating at its outer end at the feed-door 6. Within the body portion of the chamber is a water chamber 7 through which extend from the division wall 8 to the rear end 9, the flues 10.

The circulation after passing through the flues 10 passes upward between the end of the heater and the wall 11 into the rectangular flue 12 extending from rear to front along the body of the heater. At the front end of the flue the products of combustion pass thence down the sides of the heater, as indicated by

the arrows in Fig. 1, to the chimney or smoke-flue 13. On top of the body portion of the heater, as shown in Figs. 1 to 4, inclusive, and forming the top wall of the flue 12 I mount the tank 14, which, in using the construction as a steam heater, is preferably maintained from one-half to two-thirds full of water, as clearly indicated in Figs. 1 to 4 inclusive. The tank 14 is in communication with the body portion of the heater by means of the circulating pipes shown at 15—15. The tank circulating pipes 15—15 are introduced, somewhat above the bottom of the tank, so that in case the water runs low, a certain amount of water will be retained in the tank and not allowed to be drawn into the body portion proper by the circulating pipes. In connection with the pipes 15, I introduce headers 16 to which the return pipes 17—17 are connected. Above the heater and tank I prefer to provide a drum 17 to act as a steam chamber and which is placed in connection with the tank 14 by two or more pipes 18. The circulating pipes 19 connect with this steam drum.

In addition to the peculiar manner in which the construction is built up, particular attention is directed to the fire-box whereby the products of combustion are super-heated as they pass over crown sheet 20 of the fire box and before passing down the outside of the heater, and by this super-heating of the products of combustion and gases, a reignition of the products of combustion is maintained at this point, producing a complete combustion, thereby deriving the greatest amount of heat from the material consumed. The whole heater, except the headers 16 and the drum 17, is inclosed in a case 21 preferably of brick, built up a little removed from the sides of the heater, forming the side flues 22—22 through which the products of combustion lastly pass in their passage toward the chimney or draft flue, as before mentioned.

In order to provide additional heating surface, in the fire-box, I provide around the walls of the fire-box a set of pipes, as indicated at A, in pairs, with a double elbow, which are secured in the wall 8 and contain the water when the device is in operation.

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

The combination in a heater, of the heater body 1 having a fire-box 2, crown sheet 20 and flues 10, a tank 14 mounted on top of the heater body and extending over the entire length of the body including the crown sheet 20, and providing between the tank and body a draft and combustion flue 12 passing over the length of the body and including the crown sheet 20, and a casing providing flues 22 on the

outside of the heater communicating with the flue 12 at the crown sheet and the chimney, substantially as set forth.

In witness whereof I have affixed my signature in presence of two witnesses.

PETER J. CROUSE.

Witnesses:

GEORGE C. CARTER,

M. A. KELLER.