

No. 677,045.

Patented June 25, 1901.

H. J. SMITH.  
GAS CONDENSER.

(Application filed Sept. 29, 1898. Renewed Nov. 12, 1900.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

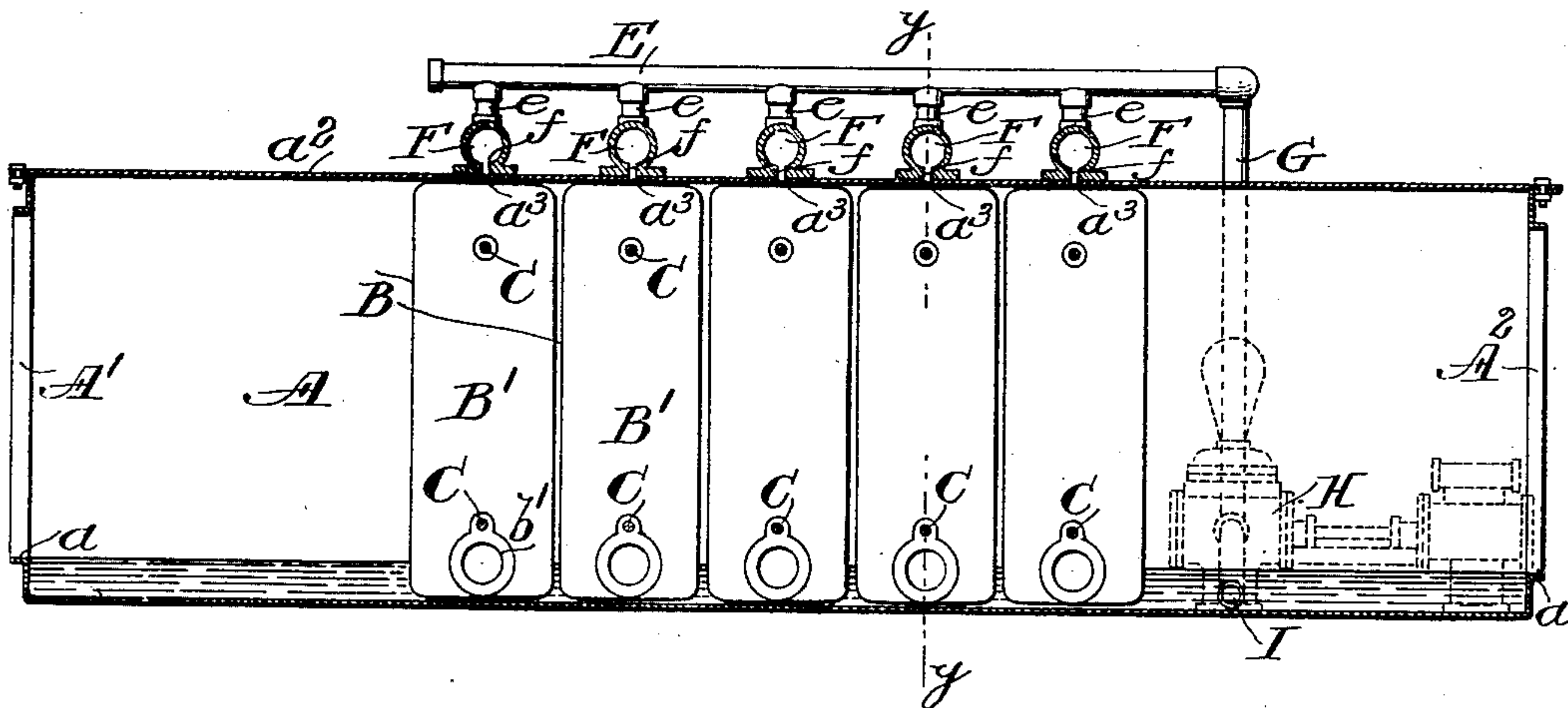
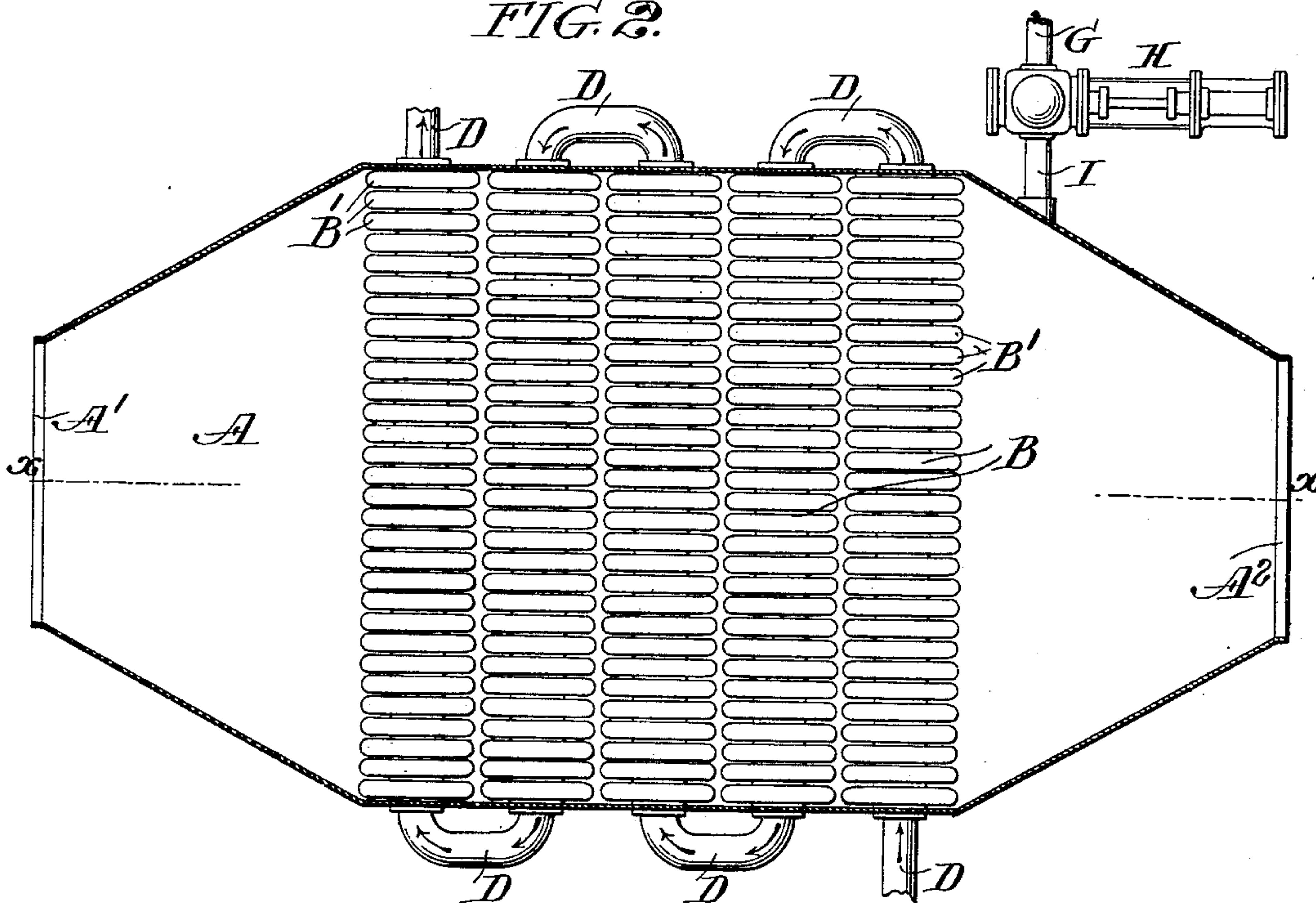


FIG. 2.



Witnesses:  
Harry Drury  
D. Shewart

Inventor:  
Harry J. Smith  
by his atty.  
Francis T. Chambers

No. 677,045.

Patented June 25, 1901.

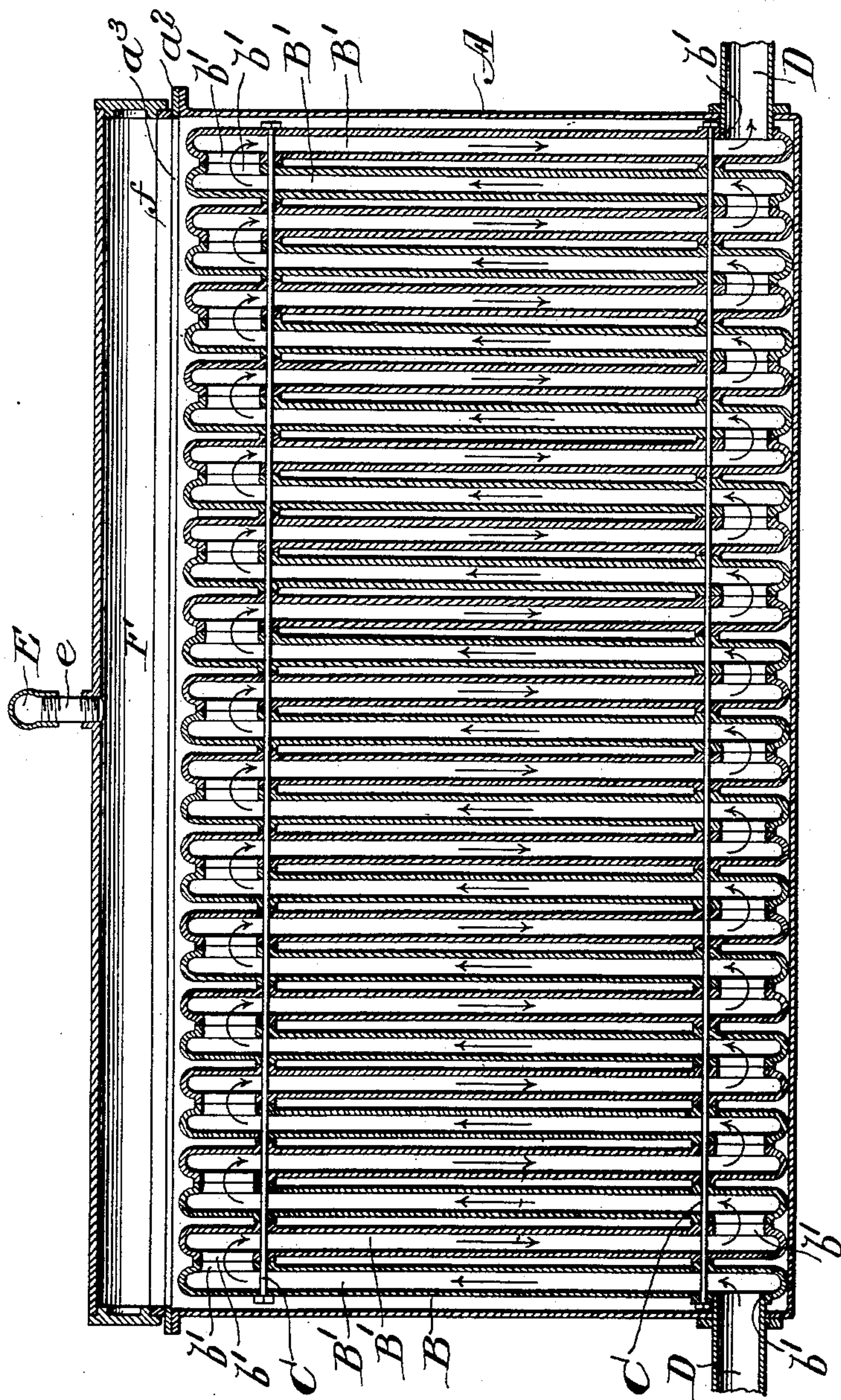
H. J. SMITH.  
GAS CONDENSER.

(Application filed Sept. 29, 1898. Renewed Nov. 12, 1900.)

(No Model.)

2 Sheets—Sheet 2.

FIG. 3.



Witnesses:  
Henry Dwyer  
L. H. H. H.

Inventor:  
Harry J. Smith  
by his atty  
James T. C. Chambers



# UNITED STATES PATENT OFFICE.

HARRY J. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

## GAS-CONDENSER.

SPECIFICATION forming part of Letters Patent No. 677,045, dated June 25, 1901.

Application filed September 29, 1898. Renewed November 12, 1900. Serial No. 36,293. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY J. SMITH, a subject of the Queen of Great Britain and Ireland, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Condensers, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction of condensers for separating condensable matter from gas, and is particularly designed for use in the purification of gas derived as a by-product in coke-ovens, although adapted for use with gas from any other producer.

The object of my invention is to provide a condenser of great simplicity and efficiency of construction, and my invention will be best understood as described in connection with the drawings, in which it is illustrated, and in which—

Figure 1 is a side elevation of a condenser embodying my improvements, the view being taken on the section-line  $xx$  of Fig. 2. Fig. 2 is a plan view of the condenser with a top plate  $a^2$  removed to show its interior construction, and Fig. 3 is a cross-sectional elevation taken as on the line  $yy$  of Fig. 1 and shown on an enlarged scale.

A indicates a chamber which may be conveniently formed of iron plates and is provided with an entrance-port  $A'$  and an exhaust-port  $A^2$ , by which it is connected in a gas-conduit, and I may here explain that I contemplate connecting several such condensers as are shown in the drawings with the gas-conduit leading from the gas-producing ovens. The lower edge of the openings  $A'$  and  $A^2$  are preferably situated, as shown, at some distance above the bottom of the chamber A, so as to form at the bottom of said chamber a reservoir for condensed liquids. Such a reservoir may, however, be formed, if desired, in connection with, but not as a part of, the chamber A.

$a^2$  indicates the top plate or lid of the chamber A, which in the construction illustrated in the drawings is formed with transverse openings or slots  $a^3$   $a^3$ , &c., one of which extends along over each row of the boxes to be hereinafter described.

B B, &c., indicate parallel rows of wide and thin boxes, such as are indicated at B', &c., Fig. 3. They may conveniently be made of cast-iron and are formed with openings  $b'$   $b'$  on opposite sides—one at the top and one at the bottom—so that when the wide and thin boxes are erected and set side by side, as shown in Fig. 3, they form a continuous conduit for cold fluid. The joints adjacent to the openings  $b'$  are of course suitably packed and each series or block of boxes B' is held together by means of a clamping device, which may conveniently consist of rods, such as are indicated at C C. Each series of boxes extends across the chamber A, substantially filling it, leaving room for the passage of gas between the adjacent relatively wide sides of the boxes and in the small spaces between the series of boxes and the walls of the chamber—a construction which insures an extensive contact between the walls of the boxes and the gas passing through the chamber. Preferably I use a number of box series, such as B, connecting them together and with a source from which a cold fluid, preferably water, can be drawn by means of pipes, such as are indicated at D D, &c. By keeping the boxes cold their surfaces of course act as condensing-surfaces for the producer-gases passing over them and condensing the less volatile portions. The said construction of the condensing-conduits, made up of the boxes, while a feature of my invention is not in its broader sense an essential feature, and any convenient condensing-conduit forming a partition across the chamber A with interstices between its convolutions for the passage of gas may be used within the sense of my broader claims.

E is a conduit connecting through its extension G with a pump H, which by means of a suction-pipe communicates with a reservoir for condensed liquor. The conduit E connects through branches  $e$   $e$  with a series of chambers F F, &c., which, as shown, are situated on top of the plate  $a^2$  and are formed with longitudinal slots  $f$ , which register with the slot  $a^3$ , and are thus opened along the tops of each box series B. By this or any equivalent device the liquor is constantly pumped from the reservoir and forced to flow over the surfaces of the condensing-conduit made up of the boxes B'. The film of tarry liquor



with which the boxes are thus constantly covered greatly promotes the condensation and separation of the condensable matter in the gas.

5 The operation of my apparatus has been fully described with the description of its parts and construction, and need not, therefore, be further specified.

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

1. A condenser for separating condensable matter from gas consisting of a chamber A adapted to connect in a gas-conduit in combination with one or more series of wide and thin boxes B' set side by side and connected in series as described to form a conduit for cold fluid said series of connected boxes forming partitions across the chamber A with interstices for the passage of gas between them and in contact with their adjacent walls.

2. A condenser for separating condensable matter from gas consisting of a chamber A adapted to connect in a gas conduit in combination with one or more series of wide and thin boxes B' set side by side and connect-

ed in series as described by transverse rods C C to form a conduit for cold fluid said series of connected boxes forming partitions across the chamber A with interstices for the passage of gas between them and in contact with their adjacent walls.

3. A condenser for separating condensable matter from gas consisting of a chamber A adapted to connect in a gas-conduit in combination with one or more series of wide and thin boxes B' set side by side and connected in series as described to form a conduit for cold fluid, said series of connected boxes forming partitions across the chamber A with interstices for the passage of gas between them and in contact with their adjacent walls, delivery-openings  $a^3$  extending over each series of connected boxes, a reservoir for condensed liquor and a pump connected to draw said liquor from the reservoir and force it through the delivery-openings over the boxes.

H. J. SMITH.

Witnesses:

CHAS. F. MYERS,  
D. STEWART.