

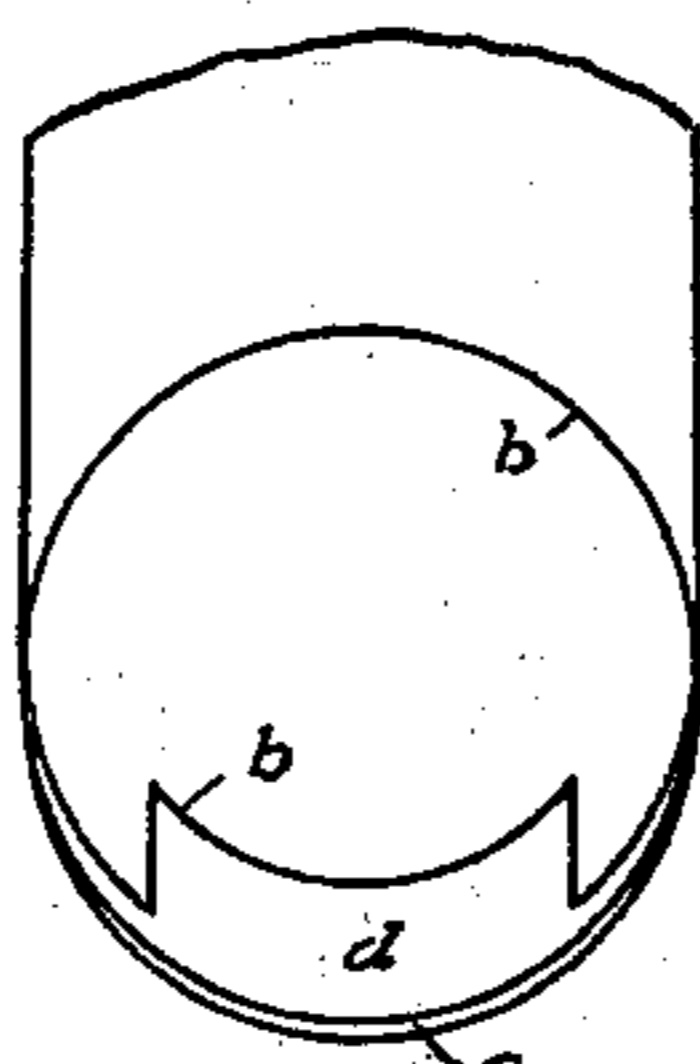
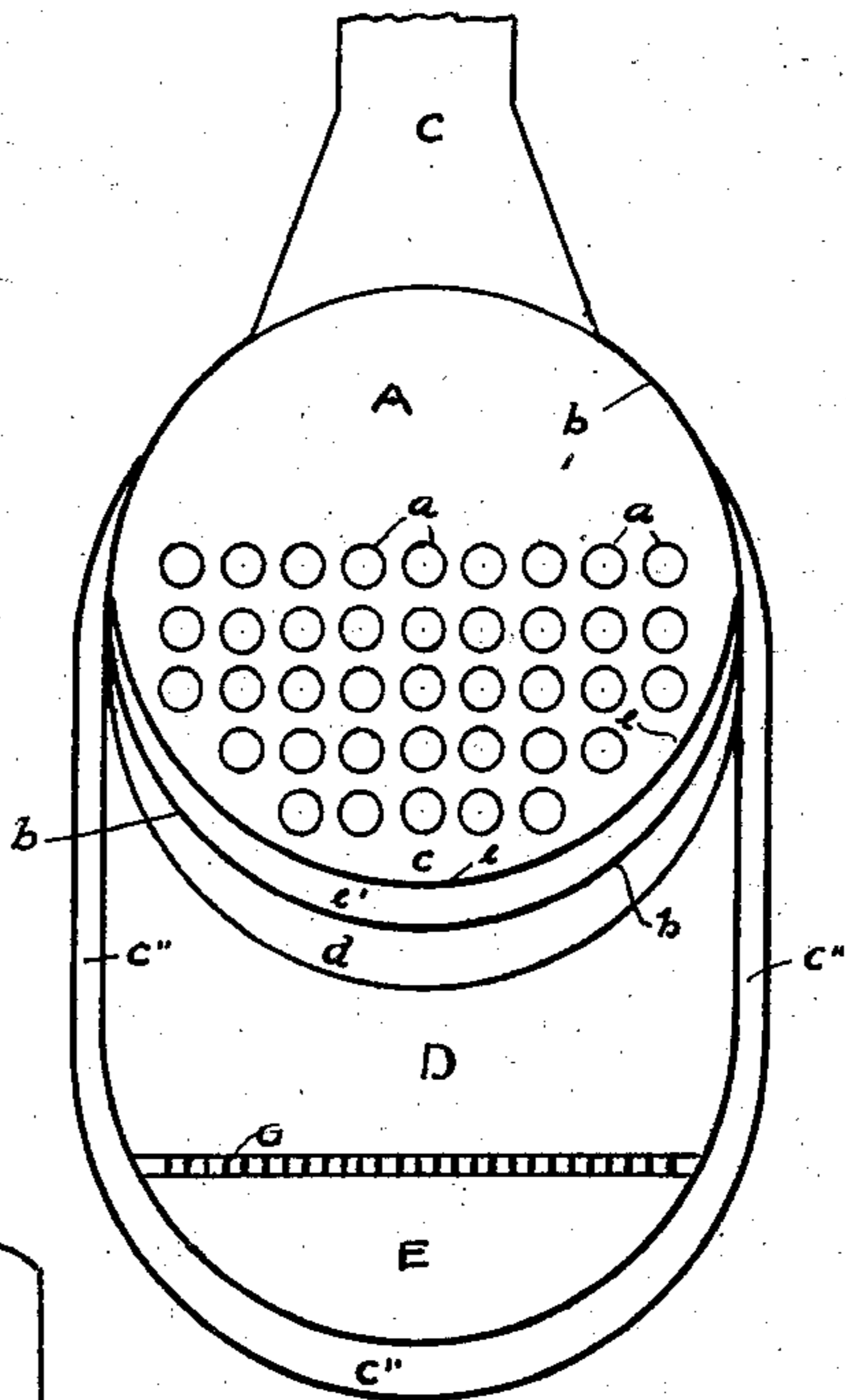
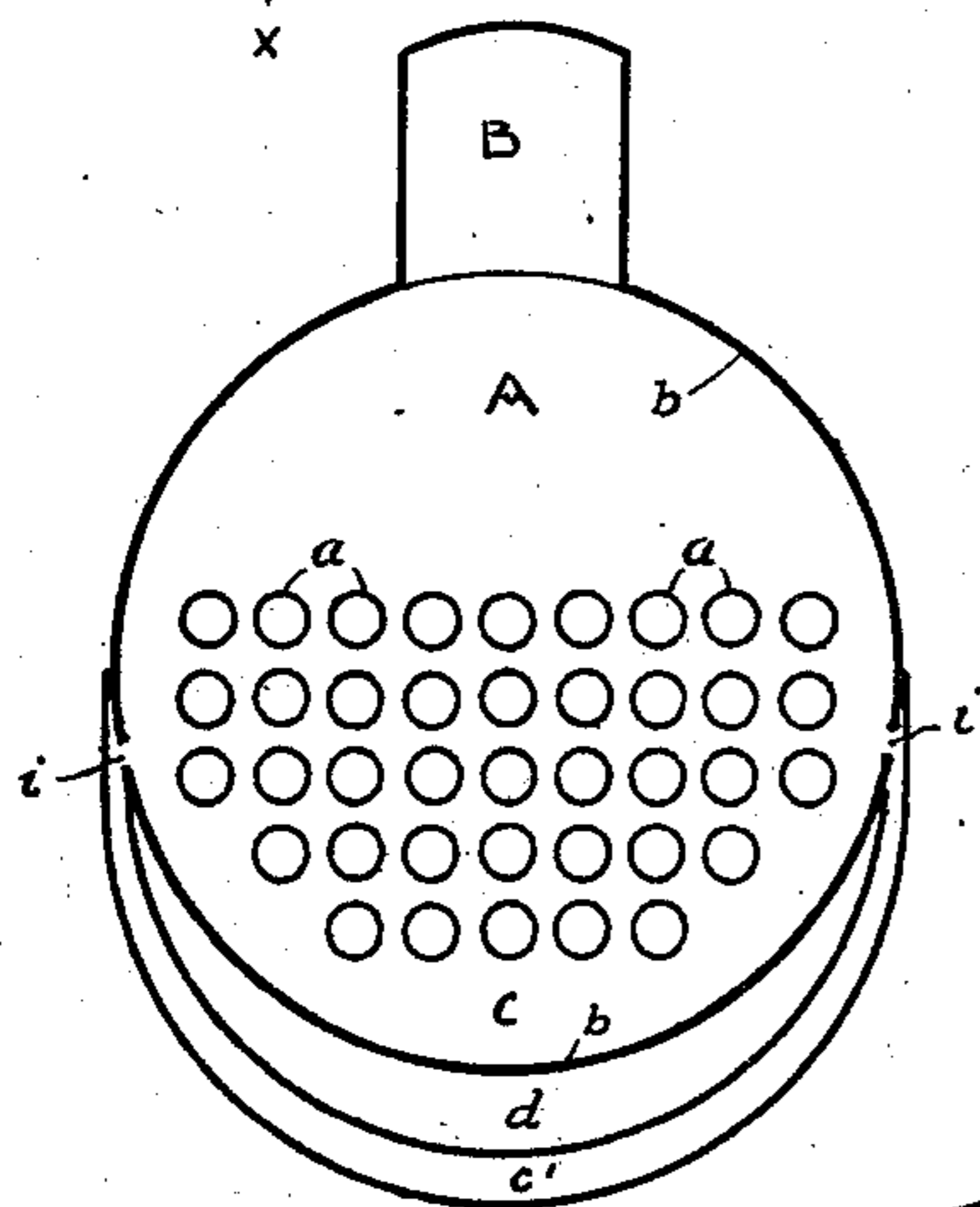
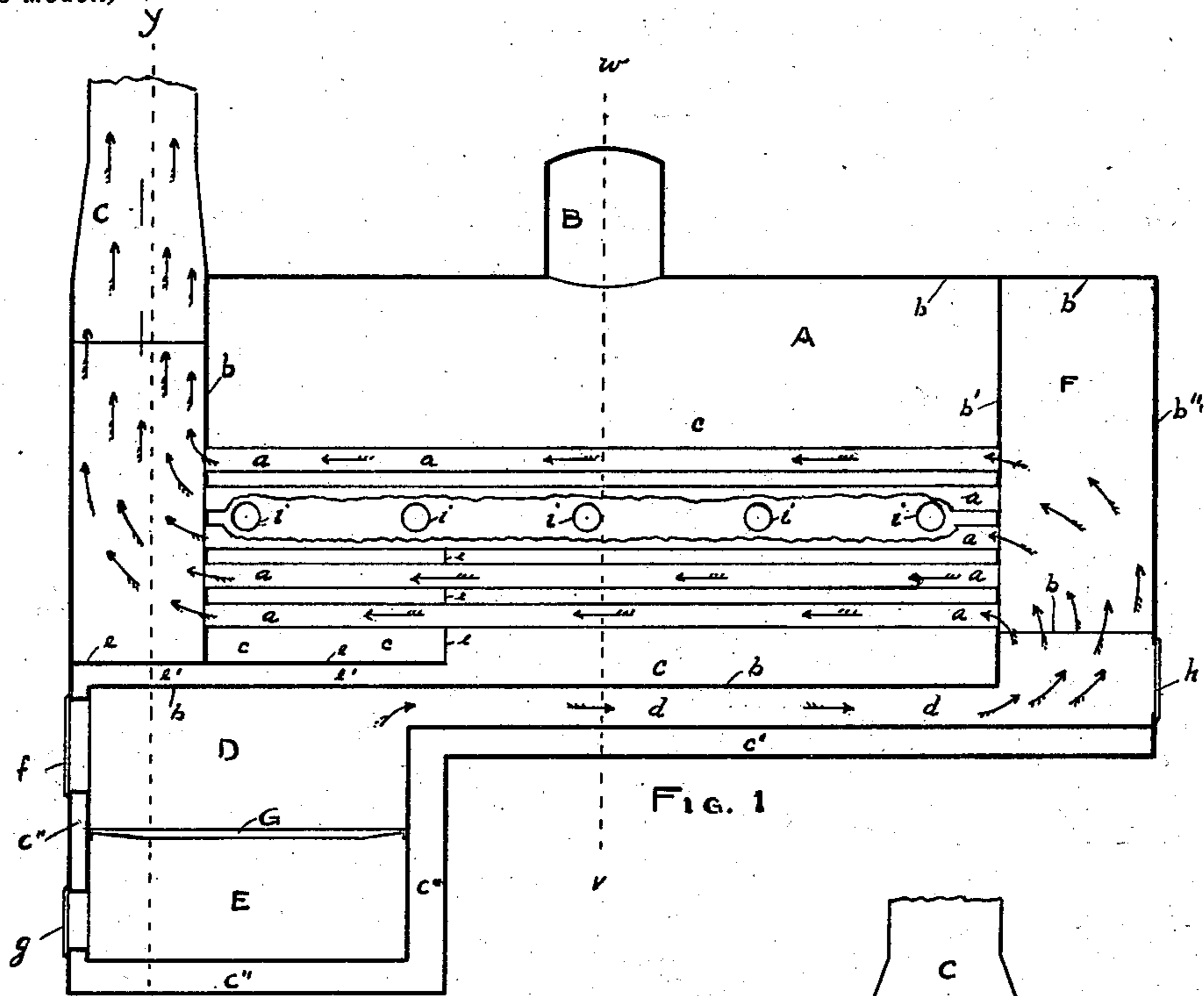
No. 701,939.

Patented June 10, 1902.

J. F. ROSE.
BOILER.

(Application filed July 6, 1901.)

(No Model.)



WITNESSES:

R. H. Henderson
P. F. Swinart,

INVENTOR

J. F. Rose,
BY
H. C. Gardner,
ATTORNEY

UNITED STATES PATENT OFFICE.

JOSEPH F. ROSE, OF DANBURY, IOWA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 701,939, dated June 10, 1902.

Application filed July 6, 1901. Serial No. 87,291. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH F. ROSE, a citizen of the United States, residing at Danbury, in the county of Woodbury and State of Iowa, (whose post-office address is Danbury, Iowa,) have invented a new and useful Improvement in Boilers; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to steam-engine boilers of the kind commonly known as "return-flue" boilers.

The object of my invention is to produce a return-flue boiler which will utilize all the water-space in the most practical and effective manner and produce the greatest quantity of steam with the least consumption of fuel.

My invention consists in the novel construction, arrangement, and combination of parts, as will be specifically pointed out in the claim.

In the drawings, Figure 1 is a longitudinal sectional view of boiler, fire-box, and smoke-stack. Fig. 2 is a cross-sectional view of boiler, taken on the line *vw* of Fig. 1. Fig. 3 is a cross-sectional view of boiler, fire-box, and smoke-stack, taken on line *xy* of Fig. 1. Fig. 4 is a perspective view of front end of boiler-shell.

Referring to the drawings, in which like parts are designated by similar letters of reference, A designates the boiler proper, and B the dome of the boiler.

C designates the smoke-stack, and D the fire-box.

E is the ash-pit.

F is the open space in front of boiler proper, connecting the forward flue with the return-flues. The small tubes *aaa* are the return-flues, running longitudinally through the lower half of the boiler, connecting the smoke-stack with the space F in front.

b designates the cylindrical shell of the boiler, the lower portion of which forms the upper part of covering of the fire-box, and *b'b'* the partitions separating the water-space of the boiler proper from the water-space F and the smoke-stack.

b'' designates the boiler-head.

c designates the water-space of the boiler proper, and *c'* the water space or chamber beneath the forward flue.

d is the forward flue of the boiler and consists of a chamber situated directly beneath the boiler proper, covering about one-third of the lower circumference of the boiler-shell and connecting the fire-box with the space F in front. The water-space *c'* is situated underneath this flue, covering the same, and extends somewhat higher upon the sides of the boiler, as seen in Fig. 2. It has free communication with the principal water-space *c* by means of the openings *iii* in the sides of the boiler proper.

e is a lining curved to conform to the shape of the lower part of the boiler and is situated within the rear part of boiler proper. It extends under the smoke-stack, forming a chamber *e'* between the fire-box and smoke-stack. It projects forward as far as the fire-box and upon the sides of the boiler as high as the openings *ii*. The space *e'* furnishes communication between the water-space *c* of the boiler and the water-spaces *c''c''* under and upon the sides of the fire-box.

f is the door to the fire-box, *g* the door to ash-pit, and *h* the door to the space F in front end of boiler.

As seen in Fig. 4, the lower part of the boiler-shell between the partition *b'* and the boiler-head *b''* is removed in order to furnish free communication between the forward flue *d* and the return-flues *aaa*. The arrows indicate the direction of the draft.

It will be seen that in my invention there is no dead-water under or around the forward flue, as is the case with the return-flue boilers now in use. The forward flue *d* being a shallow chamber of the same shape of the lower part of the boiler and covering the lower circumference of the boiler utilizes the heat without detracting from the water-space. The water-spaces *c'* and *c''* prevent any waste of heat from the forward flue or the fire-box.

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

The combination with the shell of a boiler, the lower or under surface thereof forming the upper part or covering of the fire-box underneath said boiler, a smoke-stack at the end of said boiler over the fire-box, flues connecting said smoke-stack with a space or compartment at the opposite end of said boiler, of a

fire-box under one end of said boiler, a shallow chamber of the same shape as the lower part of the boiler covering the lower circumference of the boiler and freely communicating with the fire-box and space in front of the boiler, a water-chamber underneath said shallow chamber extending upon the sides of the boiler and around said fire-box, said water-chamber having free communication with the

water-space of the boiler through openings in the sides thereof, substantially as described.

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

JOSEPH F. ROSE.

Witnesses:

R. F. HENDERSON,
F. W. LOHR.