

No. 705,293.

Patented July 22, 1902.

F. W. REICH.
FEED WATER HEATER.
(Application filed Mar. 27, 1902.)

(No Model.)

FIG. 1.

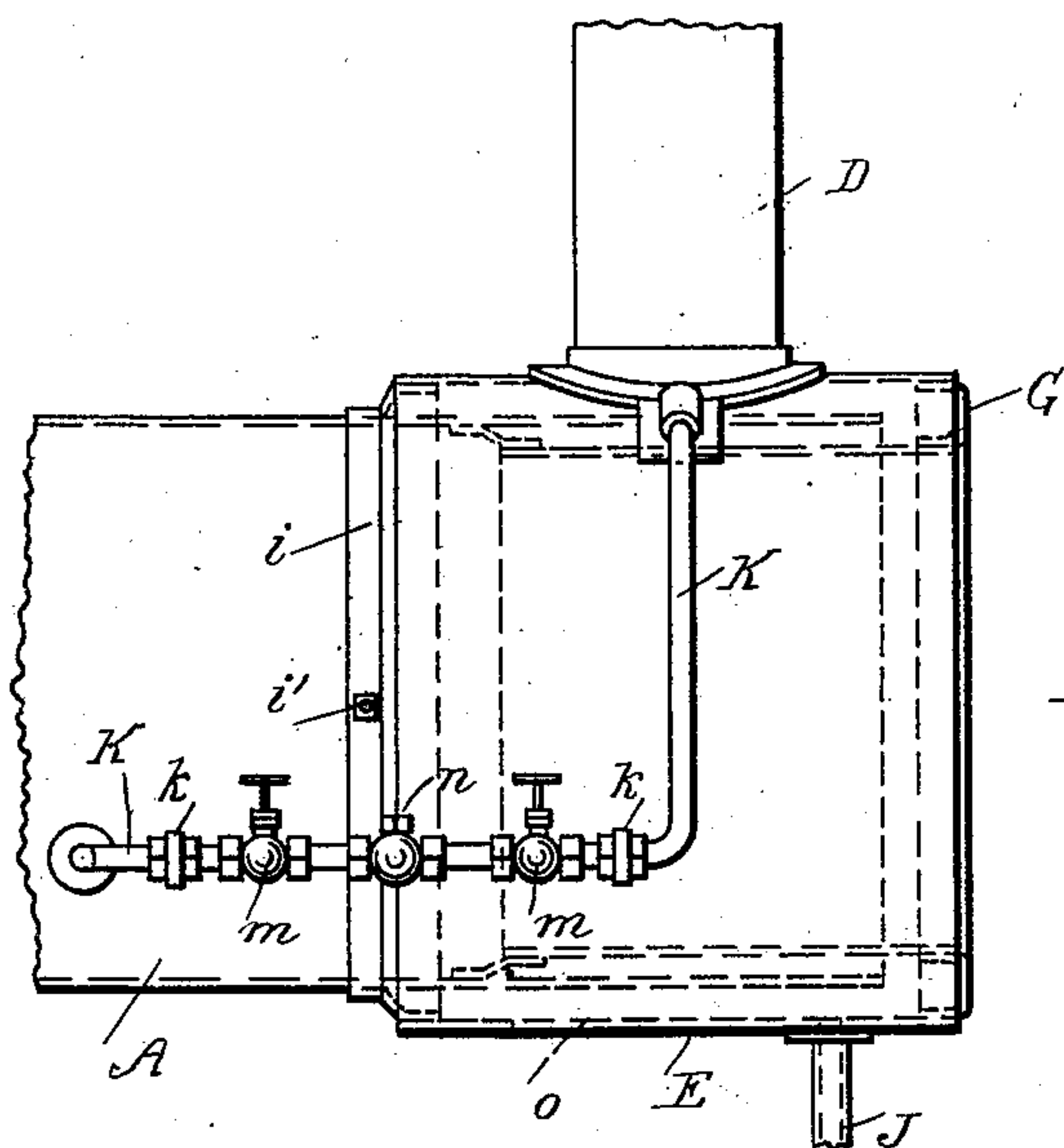


FIG. 2.

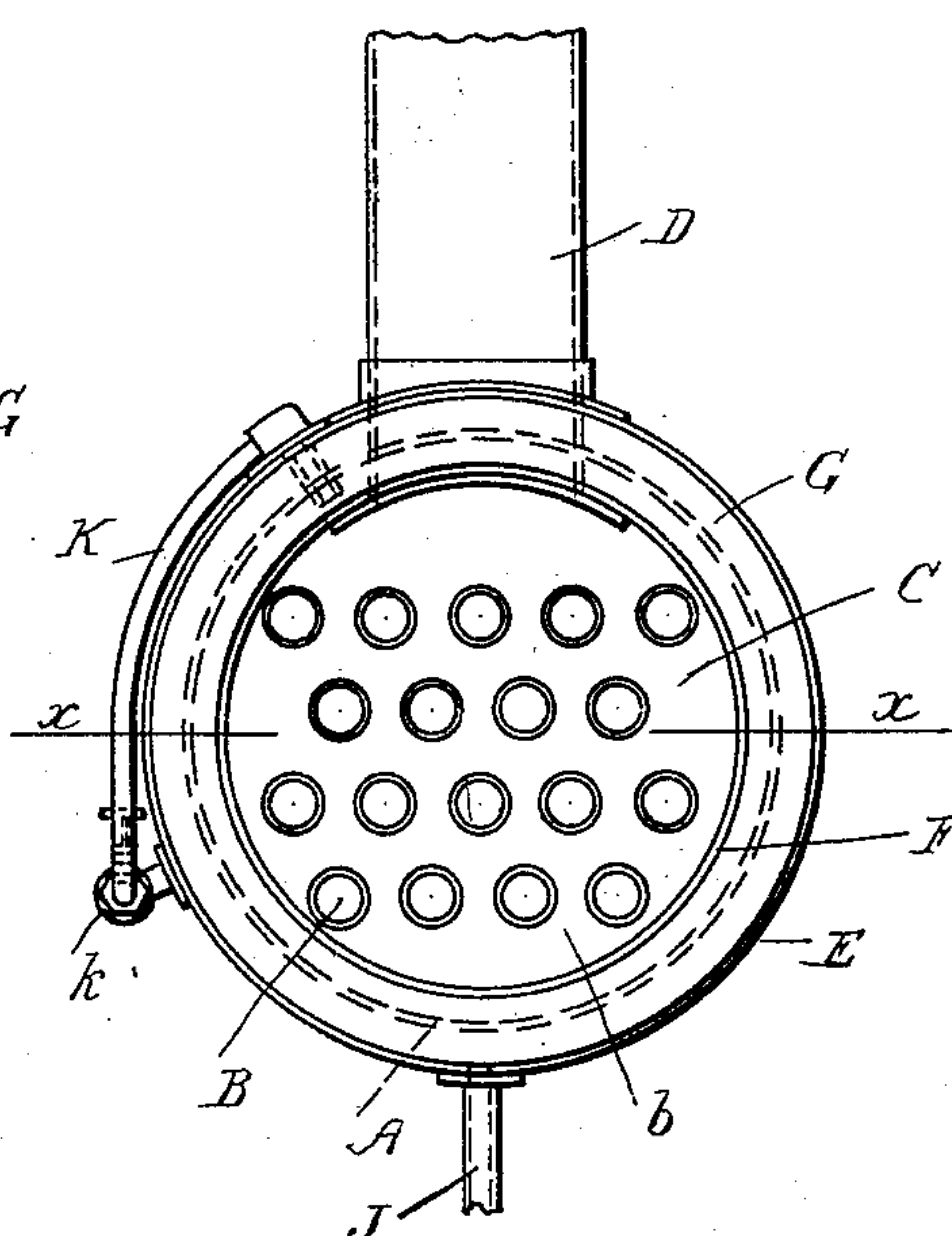
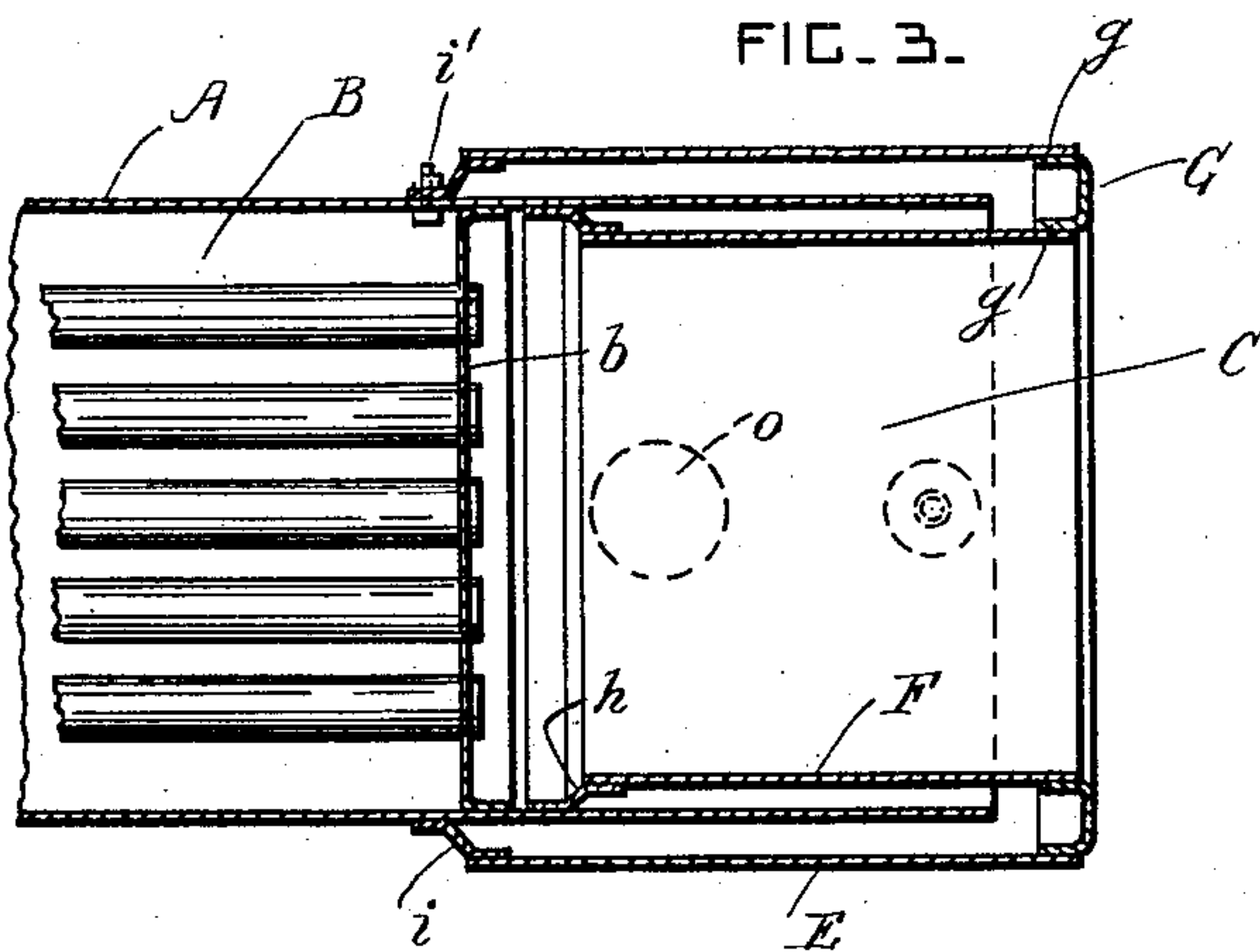


FIG. 3.



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FRED W. REICH, OF TIPTON, KANSAS.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 705,293, dated July 22, 1902.

Application filed March 27, 1902. Serial No. 100,256. (No model.)

To all whom it may concern:

Be it known that I, FRED W. REICH, a citizen of the United States, residing at Tipton, in the county of Mitchell and State of Kansas, have invented certain new and useful Improvements in Feed-Water Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to feed-water heaters for steam-boilers; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a side view of the front end portion of a horizontal fire-tube boiler, showing the feed-water heater in position. Fig. 2 is an end view of the feed-water heater. Fig. 3 is a sectional plan view taken on the line $\alpha\alpha$ in Fig. 2.

A is the shell of the boiler, which is of the portable type, and B denotes its horizontal fire-tubes, which are secured to the front tube-plate b .

C is the smoke-box at the front end of the boiler, and D is the chimney or chimney-pipe. The novel feed-water heater may, however, be applied to all types of boiler to which it can be attached.

E is the outer shell of the feed-water heater, and F is its inner shell. These two shells are arranged concentric with each other, and G is an annular plate provided with flanges g , which are secured to the front end portions of the two shells. The rear end portions of the two shells are provided with two flanged rings h and i , which are bent in opposite directions. The feed-water heater is slipped over the smoke-box end of the boiler, as shown, so that one ring, h , comes inside the smoke-box close to the tube-plate b and the other ring, i , comes outside the boiler. The said rings are then secured by bolts i' or other fastening devices to the boiler-shell, so as to make water-tight joints and so that the feed-water heater may be removed when necessary.

The chimney-pipe D is secured in holes cut in the two shells E and F and is flanged and secured so as to be water-tight, as shown.

J is the inlet-pipe for feed-water, which is

connected to the under side of the shell E, where the water in the heater is always coolest.

K is the outlet-pipe, which is connected at one end to the shell of the boiler below the water-level and at the other end to the upper part of the feed-water heater near the shell F, where the water is hottest, and so that the feed-water heater is always full of water unless the water is drained off through a suitable valve. The pipe K is preferably provided with two unions k , two stop-valves m , and a check-valve n between the two stop-valves m . This construction permits of the removal of the feed-water heater, and the valves are very convenient in working the boiler. A hand-hole o is formed in the lower part of the shell E for the removal of scale and dirt.

The rear end portions of the two shells of the feed-water heater may be secured to the front end portion of the shell of the boiler near the tube-plate in any other approved manner in carrying out this invention.

What I claim is—

1. The combination, with a boiler-shell having an end plate and a prolongation which forms a smoke-box; of a feed-water heater having an inner shell secured to the inside of the said prolongation at one end, and an outer shell secured to the outside of the boiler at the same end, thereby forming a water-space on each side of the said prolongation, and a ring connecting the said inner and outer shells together beyond the end of the said prolongation, substantially as set forth.

2. The combination, with a boiler-shell having an end plate and a prolongation which forms a smoke-box; of a feed-water heater having an inner shell and an outer shell, two flanged rings secured respectively between the said boiler and the outer shell and between the said prolongation and the inner shell, thereby forming a water-space on each side of the said prolongation, and a ring connecting the inner and outer shells together beyond the end of the said prolongation, substantially as set forth.

3. The combination, with a boiler-shell having an end plate and a prolongation which forms a smoke-box; of a feed-water heater

having an inner shell secured to the inside of
the said prolongation, and an outer shell se-
cured to the outside of the boiler-shell at the
same end, thereby forming a water-space on
5 each side of the said prolongation, and a ring
connecting the said inner and outer shells be-
yond the end of the said prolongation; and
a smoke-pipe which passes through the said

inner and outer shells and prolongation, sub-
stantially as set forth.

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

FRED W. REICH.

Witnesses:

NICHOLAS ARNOLDY,
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