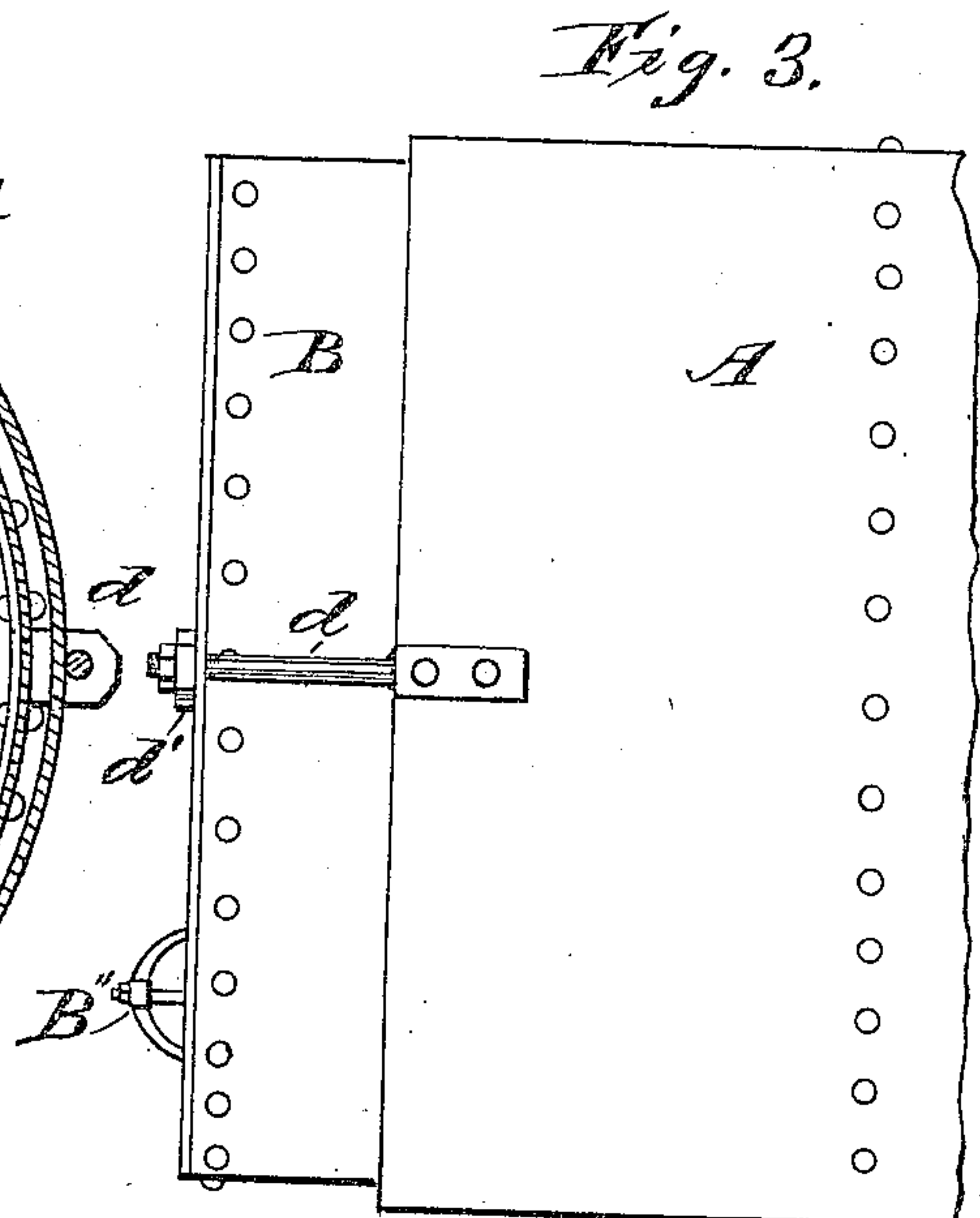
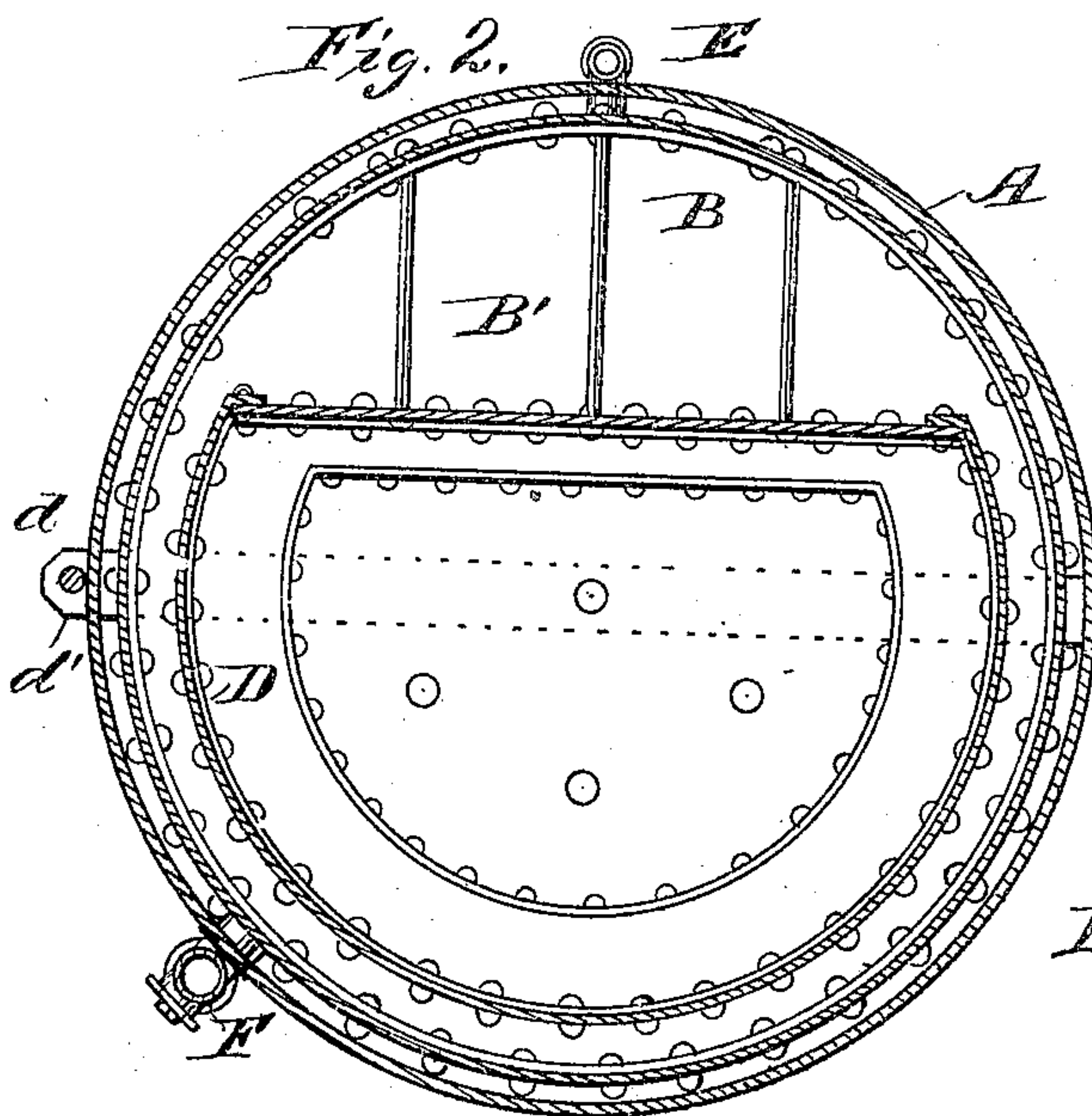
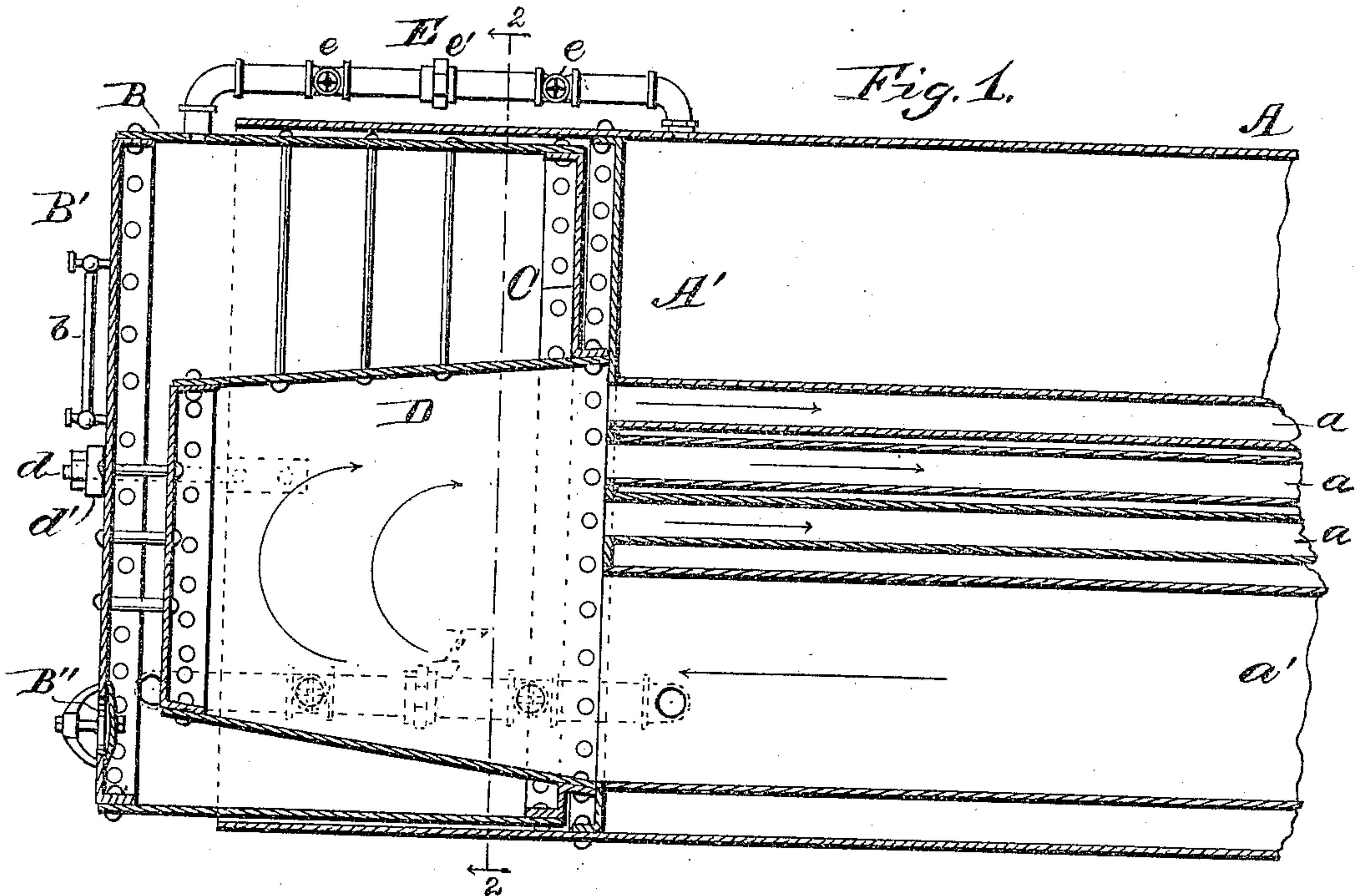


No. 810,732.

PATENTED JAN. 23, 1906.

G. A., R. & H. ERICKSON.
FEED WATER HEATER.

APPLICATION FILED JULY 20, 1905.



Witnesses
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UNITED STATES PATENT OFFICE.

GUSTAF A. ERICKSON, ROBERT ERICKSON, AND HILDOR ERICKSON, OF
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FEED-WATER HEATER.

No. 810,732.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed July 20, 1905. Serial No. 270,515.

To all whom it may concern:

Be it known that we, GUSTAF A. ERICKSON, ROBERT ERICKSON, and HILDOR ERICKSON, citizens of the United States, residing at Fort Dodge, in the county of Webster and State of Iowa, have invented certain new and useful Improvements in Feed-Water Heaters for Steam-Boilers, of which the following is a specification.

Our invention relates to improvements in that type of feed-water heaters which are attached to the rear end or the end of a boiler farthest from the fire-box and embodies certain novel features of construction, as will be hereinafter set forth, and specifically pointed out in the claim.

In the drawings, Figure 1 is a longitudinal section of our improved feed-water heater, showing the same applied to the rear portion of a boiler. Fig. 2 is a cross-section on the line 2 2, and Fig. 3 is a side elevation designed more particularly to show the tie-rods for connecting the feed-water heater to the boiler.

A refers to the outer shell of the boiler, having fire-tubes *a* and the usual larger flue *a'*, such boiler, or rather the shell of the boiler, having considerably within its rear end a partition or transverse wall *A'*, which is bolted to the boiler in the usual manner, so that the shell *A* of the boiler will in practice extend rearward beyond such partition or boiler-head. The attachment consists of a cylindrical shell or drum *B*, the rear of which is closed by a partition or end *B'*, which carries a water-gage *b* and is provided with a man-hole *B''*, which is closed in the usual manner by a bolt and crow-foot. The forward end of the drum has a wall *C*, which is attached to the shell *B* and to the open forward portion of a shell *D*, which in cross-section has a rounded portion or side and a flat top, the side and top walls converging rearward to provide a tapering fire-chamber. The fire-chamber is connected by stay-bolts to the outer shell and rear wall of the chamber which serves as the feed-water heater.

The rearward-projecting shell of the boiler *A* has tie-rods *d d* riveted or otherwise secured thereto for engagement with the cross-

bar *d'*, which extends transversely across and beyond the feed-water heater shell, so that said shell may be clamped by suitable bolts against the rear partition of the boiler, so that the flue *a'* and the fire-tubes *a* will be in line with the chamber *D* of the feed-water chamber.

The upper portion of the feed-water heater is connected to the boiler by suitable pipes and couplings, so that there will be communication at the upper portion of the boiler between the water-chamber and the upper part of the boiler, the connection *E* having cut-off valves *e e* on opposite sides of the union *e'*. The lower portion of the feed-water heater is also connected with the boiler by pipes and couplings to form a connection *F*, having cut-off valves on each side of the union the same as the steam connection which is located above the water-line, and the feed-water heater has a feed-pipe as is usual in devices of this character.

It will be noted that this device is slipped into or placed within the rearwardly-projecting exterior shell of the boiler and is drawn or clamped so that the cavity will be in communication with the flue and fire-tubes of the boiler and that the heat or products of combustion enter the cavity of chamber, so that water admitted to the feed-water heater will have its temperature raised before entering the boiler.

A device of the character described when attached to a boiler will not only serve as a feed-water heater, but will also serve to collect sediment, and thus extend the life of the boiler, and such a feed-water heater may be readily removed when worn out and replaced by another of the same construction.

Having thus described our invention, we do not wish to be limited to the precise manner of connecting the parts nor to the proportions shown; but

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

In combination with a steam-boiler the exterior shell of which extends rearwardly beyond the back end wall of the boiler, a fire-chamber and return-flue that terminates at

such end wall, of a feed-water heater having
a water-surrounded fire-chamber such cham-
ber being adapted to encompass the fire-
chamber and the return-flues of the boiler,
5 and means for clamping the feed-water heater
against the end wall of the boiler; such clamp-
ing means comprising bolts attached to the
boiler and a cross-bar with which the bolts
engage, substantially as shown.

In testimony whereof we affix our signa- 10
tures in presence of two witnesses.

GUSTAF A. ERICKSON.
ROBERT ERICKSON.
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Witnesses:

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