

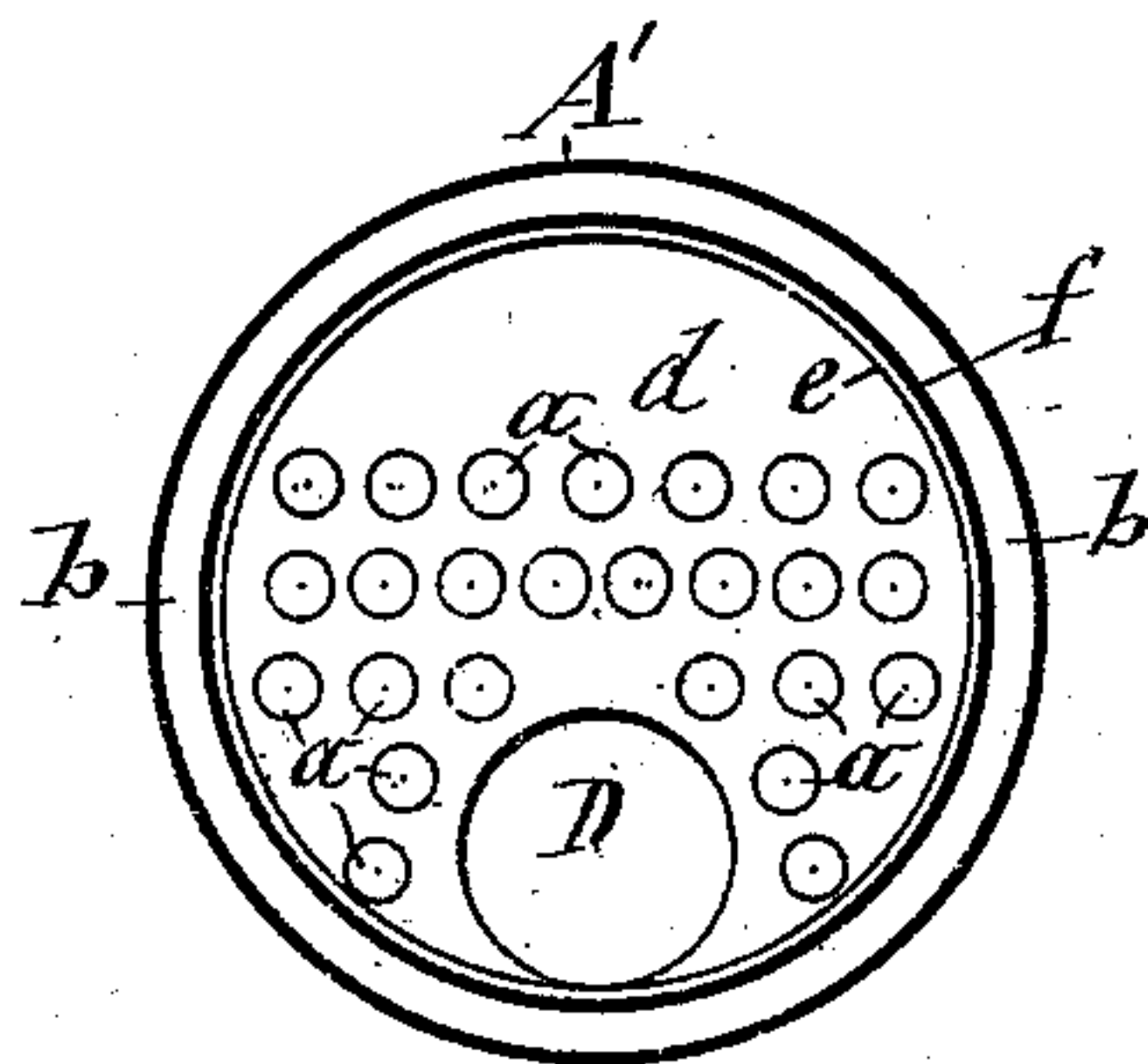
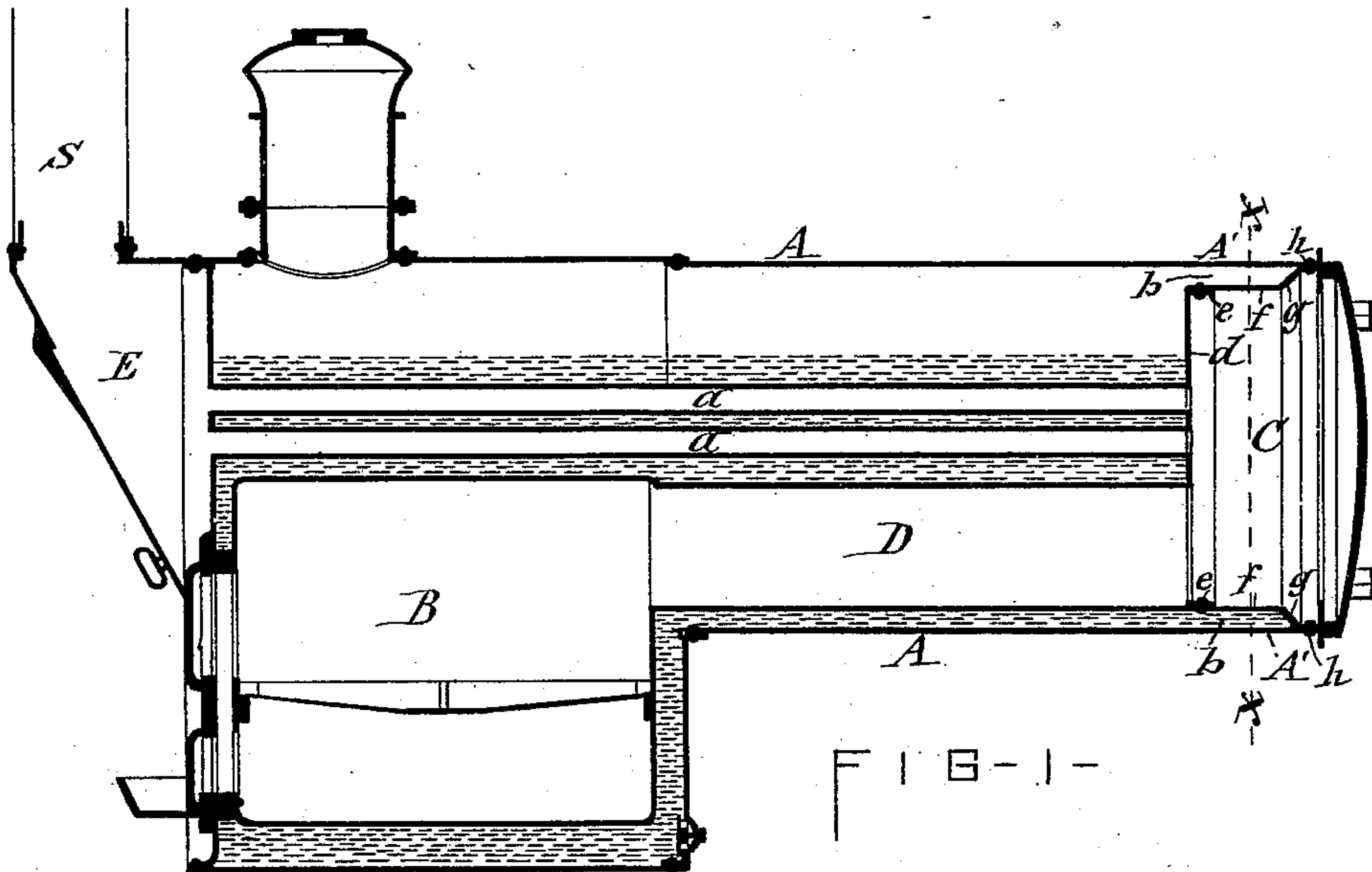
(No Model.)

G. A. PORTER.

STEAM BOILER.

No. 273,387.

Patented Mar. 6, 1883.



WITNESSES—
—*Comm* E. Raymond—
—*F. H. Gibbs*—

INVENTOR—
—*George A. Porter*—
—*per Hull, Luss & Hey*—
—*his attys*—

UNITED STATES PATENT OFFICE.

GEORGE A. PORTER, OF SYRACUSE, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 273,387, dated March 6, 1883.

Application filed January 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. PORTER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Steam-Boilers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to that class of steam-boilers which are termed "return-flue boilers." In such boilers the products of combustion pass from the furnace or fire-box through a main direct flue to the so-called "combustion-chamber" at the rear end of the boiler, and thence back through return-flues in the boiler to the smoke-box and stack on the front end of the boiler. The combustion-chamber of said boiler, especially when straw and other light fuel is used, is usually subjected to such intense heat as to necessitate the protection of its shell by a water-jacket surrounding the same. It is this water-jacket to which my invention has special reference, the object of the invention being to simplify and cheapen the construction, and at the same time give it a form which shall afford the maximum stability, and dispense with the use of stay-bolts, heretofore employed for sustaining the crown-sheet of the combustion-chamber.

The invention consists in the combination of the boiler-shell, terminating with a straight cylindrical end, the flue-sheet, of circular form, of smaller diameter than the interior of the boiler-shell and concentric therewith, and a cylindrical supplemental shell extended from said flue-sheet, and formed with a flare, and with an enlarged cylindrical end, which latter is fitted and secured to the interior of the boiler-shell, all as hereinafter more fully explained, and specifically set forth in the claim.

The invention is fully illustrated in the accompanying drawings, wherein Figure 1 is a longitudinal vertical section of a steam-boiler provided with my improvement; and Fig. 2 is a vertical transverse section of the same, taken on line *xx* in Fig. 1.

Similar letters of reference indicate corresponding parts.

A represents the shell of a return-flue boiler; B, the furnace or fire-box; C, the combus-

tion-chamber, communicating with the fire-box by the large direct flue D, extended longitudinally through the water-space of the boiler; and E denotes the smoke-box, receiving the products of combustion from the combustion-chamber C, through return-flues *a a*, extended through the boiler in the usual manner, the stack S being mounted on the smoke-box for the escape of the products of combustion.

Around the peripheral wall of the combustion-chamber C, I form a steam and water jacket, *b*, in the following manner: The main boiler-shell A, I form with a straight cylindrical extension, A', beyond the flue-sheet *d*. The flue-sheet I make circular in form and of a sufficiently smaller diameter than the interior of the boiler-shell, so that when placed in its requisite concentric position in said shell it will be isolated therefrom, and with an opening around the edge of the flue-sheet. The edge of the flue-sheet is formed with the usual outward flange, *e*, and onto the exterior of this flange I lap and rivet a supplemental shell, *f*, which is of cylindrical form, and is extended to the end of the main shell-extension, A', and joined therewith by a flare, *g*, of the shell *f*, terminating with a diametrically-enlarged straight end, *h*, fitted to the interior of the extension A', and riveted thereto in the usual manner. By this construction I obtain the desired steam and water jacket *b* around the combustion-chamber C in a very simple and comparatively inexpensive manner, forming only two joints and seams of rivets, which are convenient of access for calking and tightening; also obviating the extra expense and labor of flanging, curving, or otherwise distorting the boiler-shell, and dispensing with the stay-bolts hitherto employed for sustaining the flat crown-sheet of other combustion-chambers.

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

In a straw-burning horizontal return-flue boiler, the combination of the boiler-shell A, formed with the straight cylindrical extension A' beyond the rear flue-sheet, the direct flue D, return-flues *a a*, the circular flue-sheet *d*, of smaller diameter than and concentric with the interior of the boiler-shell, and provided with

the outward flange *e*, the cylindrical supplemental shell *f*, lapped onto flange *e*, and terminating with the flare *g* and circumferentially-enlarged straight end *h*, and joined by the latter to the interior of the end of the boiler-shell, all constructed and combined substantially in the manner described and shown.

In testimony whereof I have hereunto signed

my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 2d day of January, 1883.

GEORGE A. PORTER. [L. S.]

Witnesses:

F. H. GIBBS,

WM. C. RAYMOND.