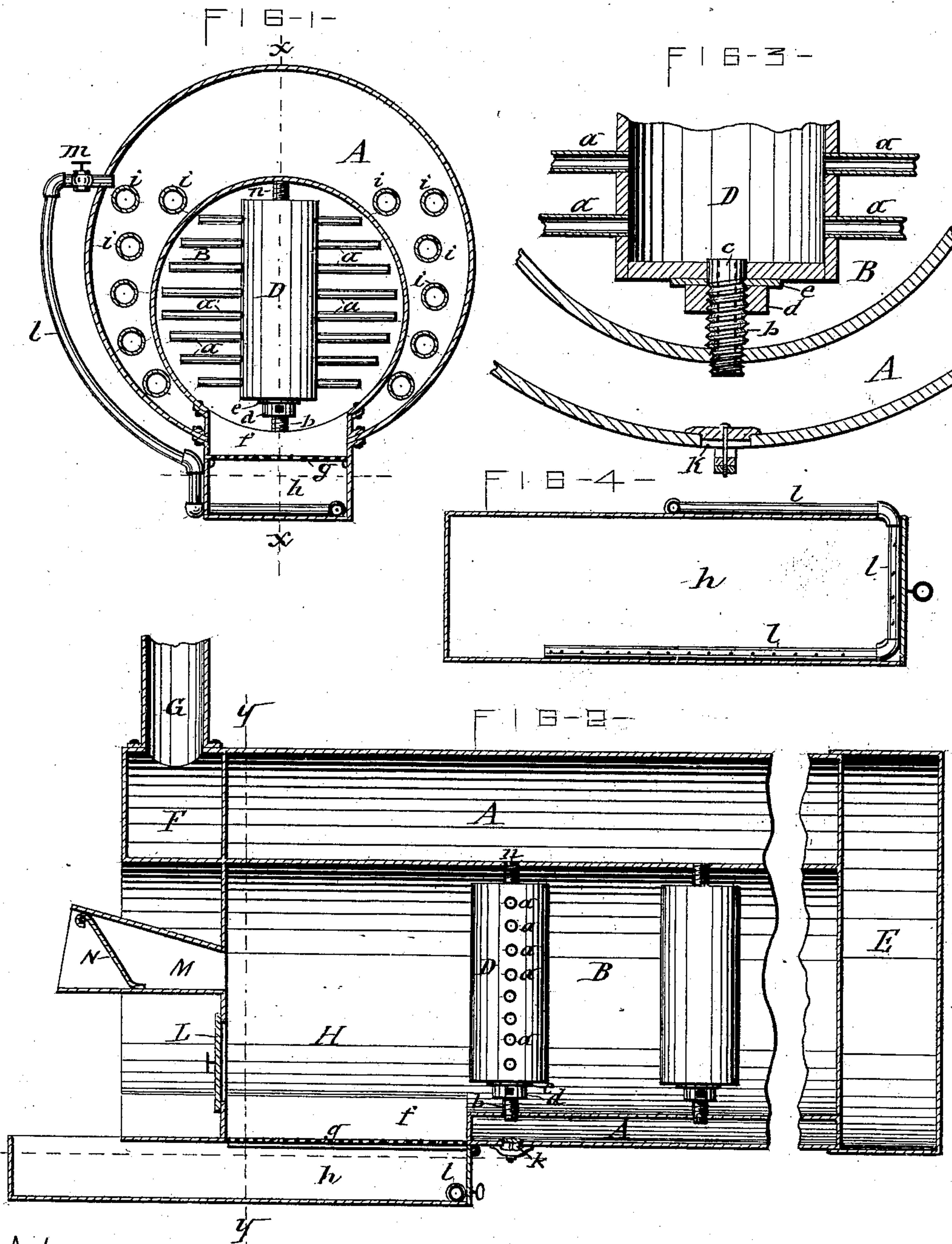


(No Model.)

W. R. MICHENER.
STRAW BURNING STEAM BOILER.

No. 272,453.

Patented Feb. 20, 1883.



WITNESSES -

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UNITED STATES PATENT OFFICE.

WILLIAM R. MICHENER, OF OSWEGO, NEW YORK.

STRAW-BURNING STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 272,453, dated February 20, 1883.

Application filed November 23, 1882. (No model.)

To all whom it may concern :

Be it known that I, WILLIAM R. MICHENER, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful
5 Improvements in Straw-Burning 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-
10 boilers which are denominated "straw-burning boilers," and in which straw-stubble and similar light fuel is used for generating steam.

This invention consists in certain novel devices applied to the boiler for the purpose of
15 rendering the same more secure against communicating fire to surrounding objects and more efficient in its operation, all as hereinafter more fully described, and specifically set forth in the claims.

The invention is fully illustrated in the annexed drawings, wherein Figure 1 is a vertical transverse section, taken through the front portion of the furnace and boiler, as indicated by dotted line *y y* in Fig. 2 of the drawings.
25 Fig. 2 is a longitudinal section of a steam-boiler provided with my improvements. Fig. 3 is an enlarged detail view of the connection of the combined cinder-arresting and water-heating drum, with the flue shell; and Fig. 4
30 is a horizontal section of the ash-pan.

Similar letters of reference indicate corresponding parts.

A represents a horizontal cylindrical boiler, longitudinally through the water-space of
35 which is extended a large main fire-flue, B, the front end portion of said flue being formed into a furnace or fire-box, H, by a depression, *f*, in which is placed the fire-grate *g*, underneath which is arranged the ash-pit *h*, in the usual manner. The opposite end of the flue
40 B intersects the usual combustion-chamber, E, built on the rear end of the boiler, and from thence the products of combustion pass through the return-flues *i i*, extended through the boiler
45 at opposite sides of the main flue B, and to the smoke-box F on the front end of the boiler, from whence the products of combustion escape through the stack G, built upon said smoke-box.

50 D represents a drum arranged vertically

across the flue B, near its junction with the furnace H, said drum being attachably connected to the shell of the flue B, and communicating with the interior of the boiler by a screw-nipple, *n*, tapped respectively in the
55 crown of the flue-shell and in the head of the drum, and by a screw-threaded tube, *b*, tapped in the bottom of the flue-shell, and having its upper end, *c*, blank or smooth and fitted loose in the bottom of the drum. A nut, *d*, on the
60 tube *b*, and a copper washer, *e*, between said nut and bottom of the drum, and pressing against the latter, secures the drum D in its position, said arrangement admitting of a ready removal of the drum D, when required
65 for repairs or renewal, by running the nut *d* down the tube *b*. Then, by turning the drum so as to unscrew it from the nipple *n*, the drum can be lifted off from the lower tube, *b*, and taken out of the flue B. The attachment of
70 the drum is equally as readily accomplished.

From opposite sides of the drum D are extended a series of branch pipes, *a a*, which are open to the interior of the drum, so as to become charged with water from the same. These
75 branch pipes are placed so close to each other and extend to such proximity to the flue-shell as to form a barrier or guard to prevent the cinders and imperfectly-consumed particles of fuel from passing into the flue D and out of
80 the stack of the boiler, thus preventing the clogging of the return-flues and other passages of the products of combustion through the boiler, and also obviating the danger of communicating fire to surrounding objects.
85

Aside from the before-stated benefits derived from the drum D and its branch pipes *a a*, it is obvious that said arrangement serves to materially enhance the heating-surface of the boiler and to produce perfect circulation of the
90 heat from the bottom to the top of the boiler.

In order to obtain ready access to the interior of the drum D and its connections with the boiler for cleaning the same, I provide the bottom of the boiler with a hand-hole, K, in
95 range with the tube *b* of the drum, as shown in Figs. 2 and 3 of the drawings. To further guard against setting fire to objects in the vicinity of the boiler I tap the water-space of the boiler by a pipe, *l*, provided with a suit-
100

able stop-cock, *m*, and extended into the ash-pan *h*, preferably into the rear end thereof, and thence along the side of the same, as shown in Fig. 4 of the drawings, the end of said pipe being closed and the portion inside of the ash-pan being perforated to discharge the water into the ashes and cinders, and thus extinguish the sparks and cool the contents of the ash-pan. By tapping the boiler with the pipe *l*, at or near the water-line of the boiler, I make said pipe serve the additional function of a surface-blower.

M represents the feed-door, through which to introduce the straw and other light fuel into the fire-box *H*, said feed-door being usually arranged near the upper portion of the fire-box and provided with a self-closing door, *N*, to permit of properly and safely applying the said fuel to the fire-box. Underneath this feed-door *M*, I provide the fire-box with a supplemental fire-door, *L*, as shown in Fig. 2 of the drawings. This latter door affords ready access to the grate for cleaning the fire, and also serves as a feed-door for the introduction

of wood or coal, thus adapting the boiler for the latter fuel as well as straw or other light fuel. 25

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

In combination with the boiler *A* and the fire-flue *B*, extended horizontally through the water-space of the boiler, as shown, the drum *D*, arranged across said flue and communicating at opposite ends with the interior of the boiler, and the branch pipes *a a*, projecting from opposite sides of the drum across the interior of the flue, substantially in the manner described and shown, for the purpose set forth. 30 35

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 Otsego, in the State of New York, this 21st day of November, 1882. 40

WILLIAM R. MICHENER. [L. S.]

Witnesses:

WM. C. RAYMOND,

FREDERICK H. GIBBS.