(No Model.)

J. O. DRAPER.

STEAM BOILER.

No. 300,767. Patented June 24, 1884.

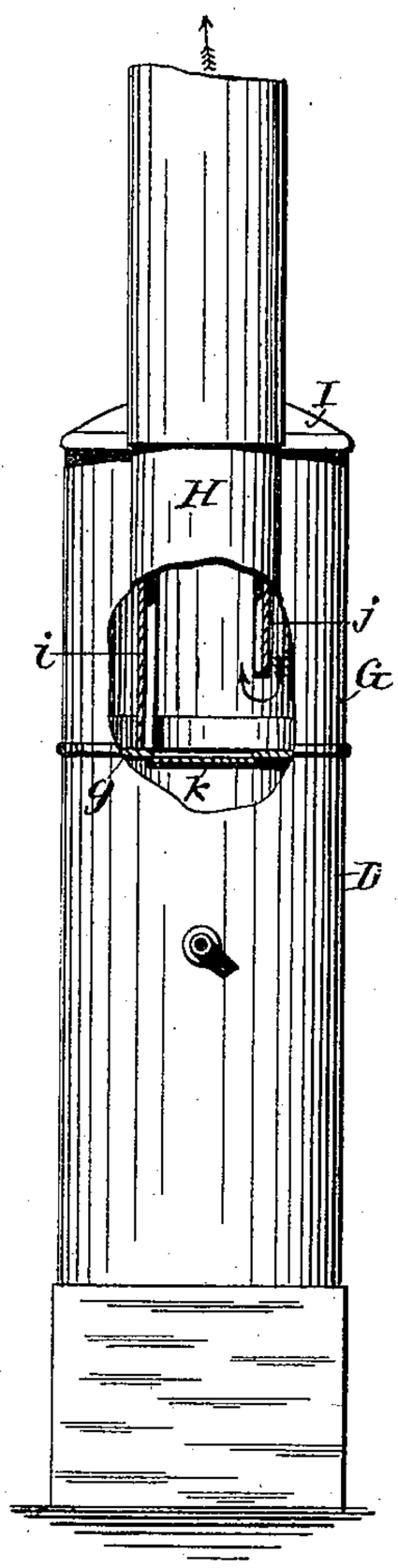

Fig. 2.

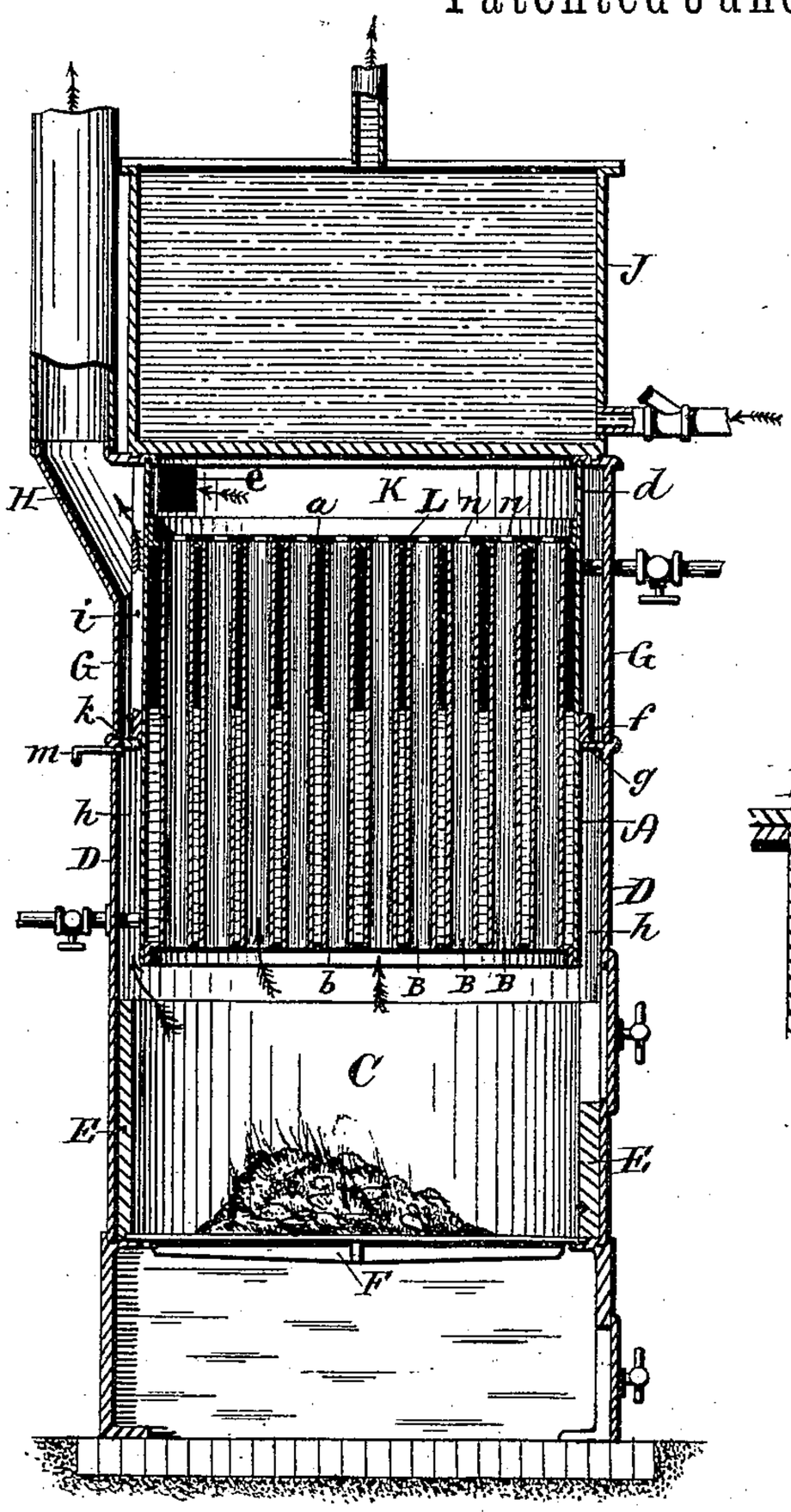

Fig. 1.

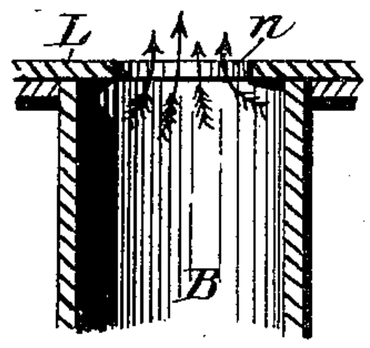

Fig. 4.

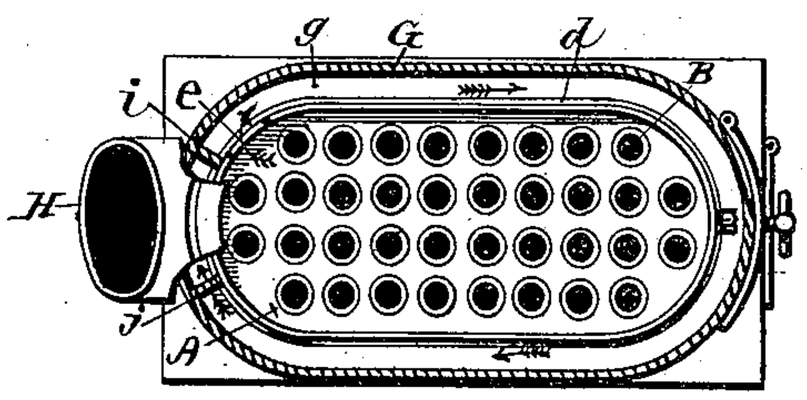

Fig. 3.

WITNESSES:

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JAMES O. DRAPER, OF PAWTUCKET, RHODE ISLAND.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 300,767, dated June 24, 1884.

Application filed March 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES O. DRAPER, of Pawtucket, in the county of Providence and State of Rhode Island, have invented an Improvement in Steam-Boilers, of which the following is a specification.

The nature of my invention consists in the improved combination of the boiler with the fire-chamber and its flues, as hereinafter fully set forth.

Figure 1 is a vertical section of the boiler, fire-chamber, and flue. Fig. 2 is a rear elevation, with a portion of the outer case broken away to show the flue-partitions. Fig. 3 is a top view, with a portion of the top of the outer casing removed to show the boiler-flues. Fig. 4 is a detail drawing of one of the boiler-flues and flue-contracting plate.

In the accompanying drawings, A is an upright boiler, which is preferably made in elongated cross-section, as shown in Fig. 2, and provided with the parallel flues B B B, which are secured in the opposite heads, *a b*, of the boiler. The shell *d* of the boiler is extended for a short distance above the upper head, *a*, and the projecting rim so formed is cut away or perforated at *e*, in order to provide an exit-passage for the smoke and products of combustion developed in the fire-chamber C, and upon the exterior of the boiler is secured the encircling-band *f*. The casing D is provided with a lining of fire-brick, E, which extends from the upper side of the grate F to near the lower end of the boiler, and the upper end of the casing D is provided with an inwardly-projecting flange, *g*, which, by extending under the band *f*, will serve to support the boiler concentrically within the casing D, thus forming an encircling-chamber, *h*, adapted to retain the heated products of combustion around the lower portion of the boiler. Above the flange *g* of the casing D is placed the upper casing, G, the rear side of which is provided with the escape-flue H, through which the products of combustion will escape to the chimney. The casing G is provided with a large opening at its upper end, to which a removable cover, I, is adapted, as shown in Fig. 2, or a water-heating tank, J, may take the place of the cover, as shown in Fig. 1; and by this means a desirable circulation of hot water may be carried to the several rooms of a building.

Between the opening *e* and the flue H is placed the partition *i*, which serves to prevent the products of combustion which pass through the opening *e* from passing thence direct to the flue, but which compels such products to pass entirely around the upper portion of the boiler, and at the side of the flue H, opposite the partition *i*, is placed the partition *j*, extending downward from the upper end of the casing G toward the flange *g* of the casing D, thus compelling the products of combustion to sink from the upper portion of the casing G, and to thus pass under the partition *j* into the flue H, as shown by the arrow in Fig. 3. An opening, *k*, is made in the flange *g*, through which, upon the proper withdrawal of the damper *m*, the products of combustion may be made to pass directly from the fire-chamber to the flue H.

In the chamber K, above the boiler-flues B, and resting on the head *a* of the boiler, is placed the removable plate L, provided with coincident perforations *n*, made much smaller than the interior diameter of the flues B, thus providing means for retarding the draft in the boiler-flues, and also for convenient access to the boiler-flues for the purpose of cleaning the same from accumulations of soot or ashes upon the ready removal of the plate L from the chamber K.

In some instances, instead of forming the outer casing of iron it may be advantageously formed with brick. Therefore I do not restrict my claim to the materials of which such casings are constructed.

I claim as my invention—

1. The combination of the upright boiler provided with the flues B B with the removable perforated plate L, the perforations of the plate being made smaller in area than the internal diameter of the flues and coincident therewith, whereby the heat will be longer retained in the flues, substantially as described.

2. The combination of the upright boiler provided with the flues B B, band *f*, and shell *d*, extended beyond the upper end of the flues B B, and provided with an outlet-orifice, *e*, with the outer casing provided with the flange

g, the partitions *i* and *j*, and flue H, substantially as and for the purpose specified.

3. The combination of the upright boiler A, having an elongated cross-section, with the band *f*, and shell *d*, extended beyond the upper end of the flues B B, and provided with an outlet-orifice, *e*, with the outer casing provided with the flange *g*, for supporting the boiler, and the partitions *i* and *j*, for directing the products of combustion around the upper portion of the boiler, substantially as described.

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Witnesses:
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