(No Model.)

W. E. HAXTUN.

VERTICAL BOILER.

No. 330,024. Patented Nov. 10, 1885.

Fig. 1.

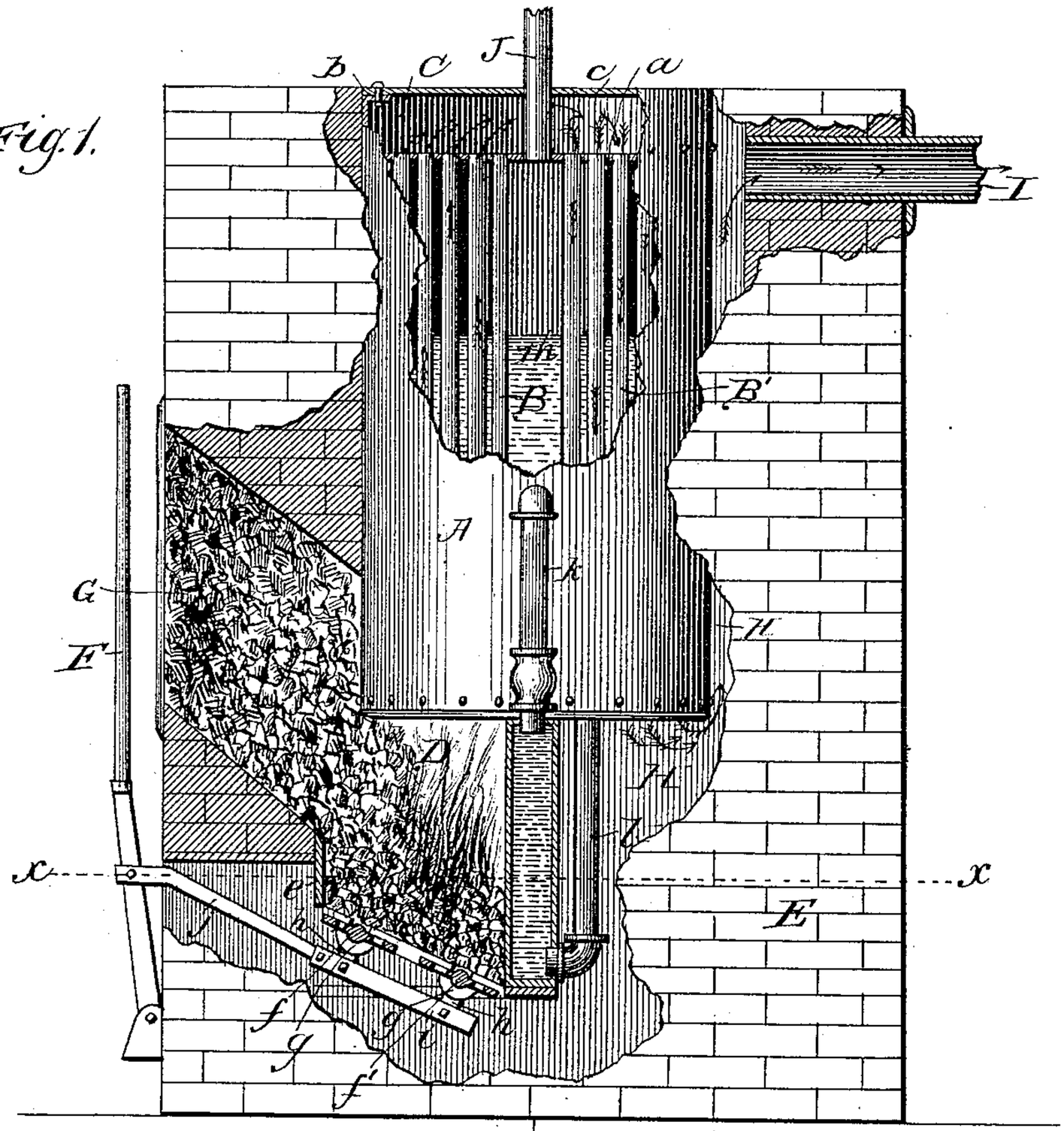
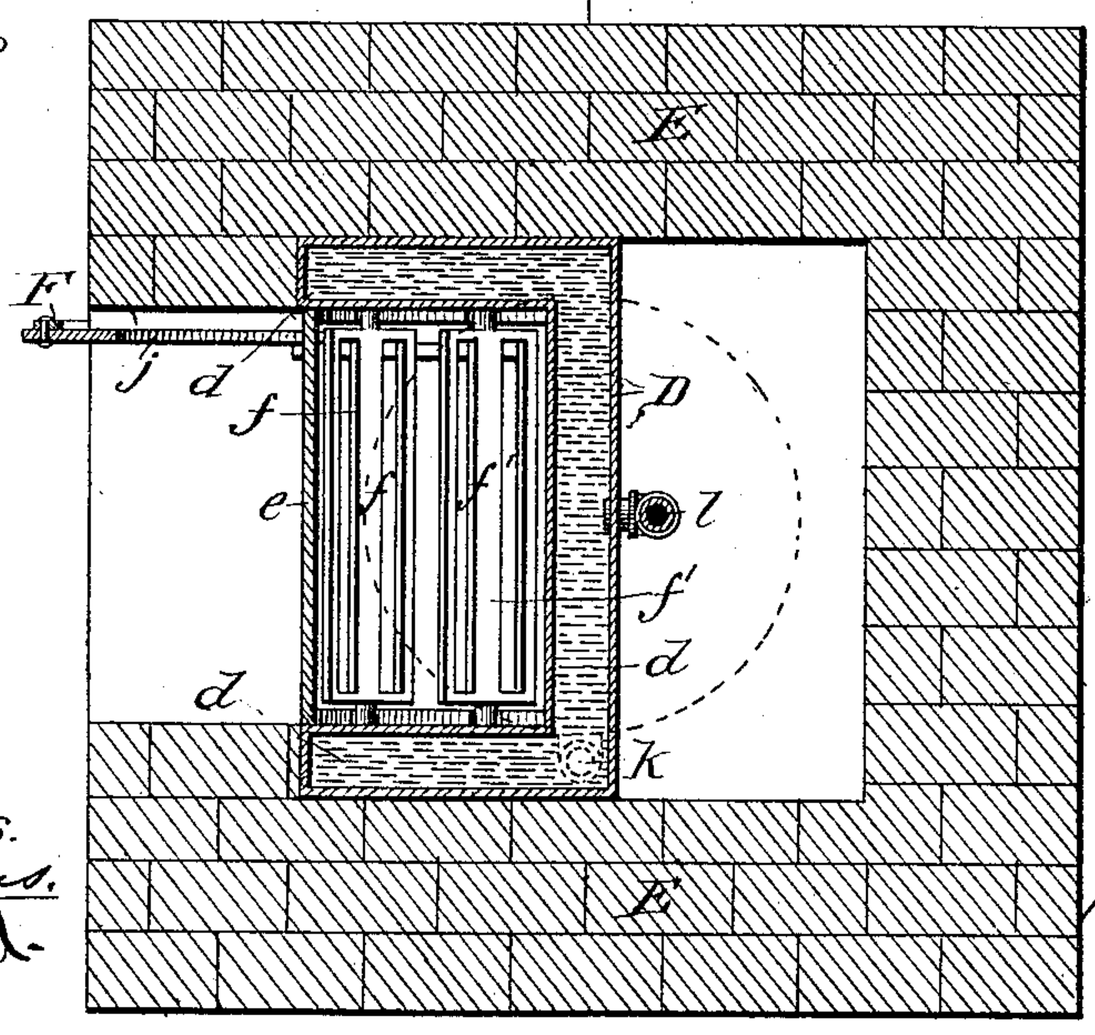


Fig. 2.



Witnesses.
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C. W. Bond.

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UNITED STATES PATENT OFFICE.

WILLIAM E. HAXTUN, OF KEWANEE, ILLINOIS.

VERTICAL BOILER.

SPECIFICATION forming part of Letters Patent No. 330,024, dated November 10, 1885.

Application filed January 15, 1885. Serial No. 152,963. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HAXTUN, residing at Kewanee, in the county of Henry and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Vertical Boilers, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation, some parts being shown in section; Fig. 2, a section at line *x* of Fig. 1.

The leading object of my invention is to combine a vertical tubular boiler with its fire-pot in such a manner that the smoke will pass up through a portion of the vertical flues, and then down through the remaining flues, which I accomplish as illustrated in the drawings.

In the drawings, A represents a vertical tubular boiler.

B are the flues in one half of the boiler, and B′ are the flues in the other half of the boiler.

a is the upper head of the boiler.

C is a smoke-chamber at the upper end of the boiler, which, as shown, is formed by extending the wall or shell of the boiler, as shown at *b*, and covering this extension with a metal plate, *c*.

D is the fire-pot, the walls of which on three sides are double, as shown in Fig. 2, the space between them forming a water-chamber, *d*.

e is a metal plate at the front of the fire-pot. The fire-pot may rest upon a metal plate to be secured in the brick-work E. The grate in the fire-pot, as shown, consists of two parts, *f f′*, the ends of each being journaled in supports *g*.

h are pendents, one from each part of the grate; *i*, a bar to which the pendents *h* are pivoted; *j*, an arm, one end of which is pivoted to the bar *i*, and the other end passes through the brick-work, and is pivoted to a lever, F.

G is a fuel-magazine.

H is a smoke-passage between the boiler and the brick-work.

I is a passage through which the smoke passes to the chimney.

k is a pipe leading from the boiler to the water-chamber *d*, around the fire-pot.

l is another pipe leading from near the bottom of the chamber *d* to the bottom of the boiler.

m represents the supposed water-line in the boiler. The space between the water-line and the head *a* forms a steam-chamber.

J is a pipe through which steam passes from the steam-chamber.

The boiler is so located that one part of it is above the fire-pot and rests thereon, it being made separate from said fire-pot, so that the flues B communicate at their lower ends with the fire-pot and at their upper ends with the smoke-chamber C, and the flues B′ communicate at their upper ends with the smoke-chamber C, and at their lower ends with the smoke-passage H.

In use the smoke which passes from the fire-pot into the flues B will pass up through them into the chamber C, thence through the flues B′ down into the smoke-passage H, thence out through I or other suitable outlet to the chimney. Thus there will be an economy in the use of fuel, because the greater part of the heat which passes into the flues B will be utilized, and very little escape to the chimney. Fuel is to be supplied to the magazine G as usual. The grates can be rocked by means of the lever F.

Suitable doors, giving access to the ash-pit and the magazine G, are to be provided.

Water communication and circulation will be kept up between the boiler and the water-chamber *d* through the pipes *k l*.

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

The combination of the fire-box having three sides hollow, to constitute a water-chamber, an upright boiler resting upon the fire-box, and formed with a smoke-chamber at its upper end, and having a series of vertical smoke-flues passing through it, a portion of said flues communicating with the fire-box on one side of the rear wall thereof and with the upper smoke-chamber, and the other portion with the same chamber, and a smoke-passage on the opposite side of said rear wall, and pipes connecting the boiler with the upper and lower portions of the water-chamber to the fire-box, substantially as described.

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Witnesses:
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