

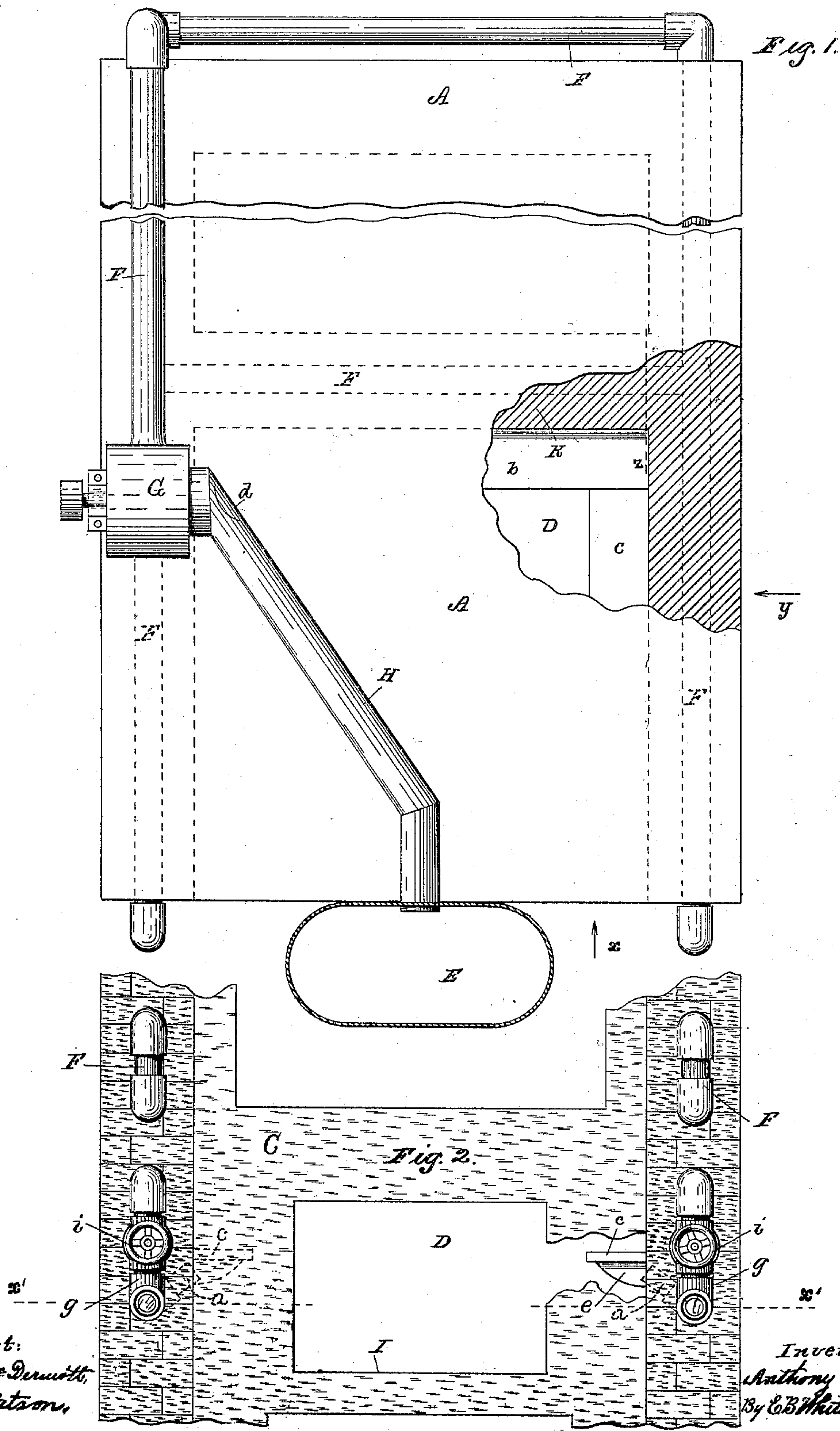
(No Model.)

2 Sheets—Sheet 1.

A. SNELL.
STEAM BOILER FURNACE.

No. 408,267.

Patented Aug. 6, 1889.



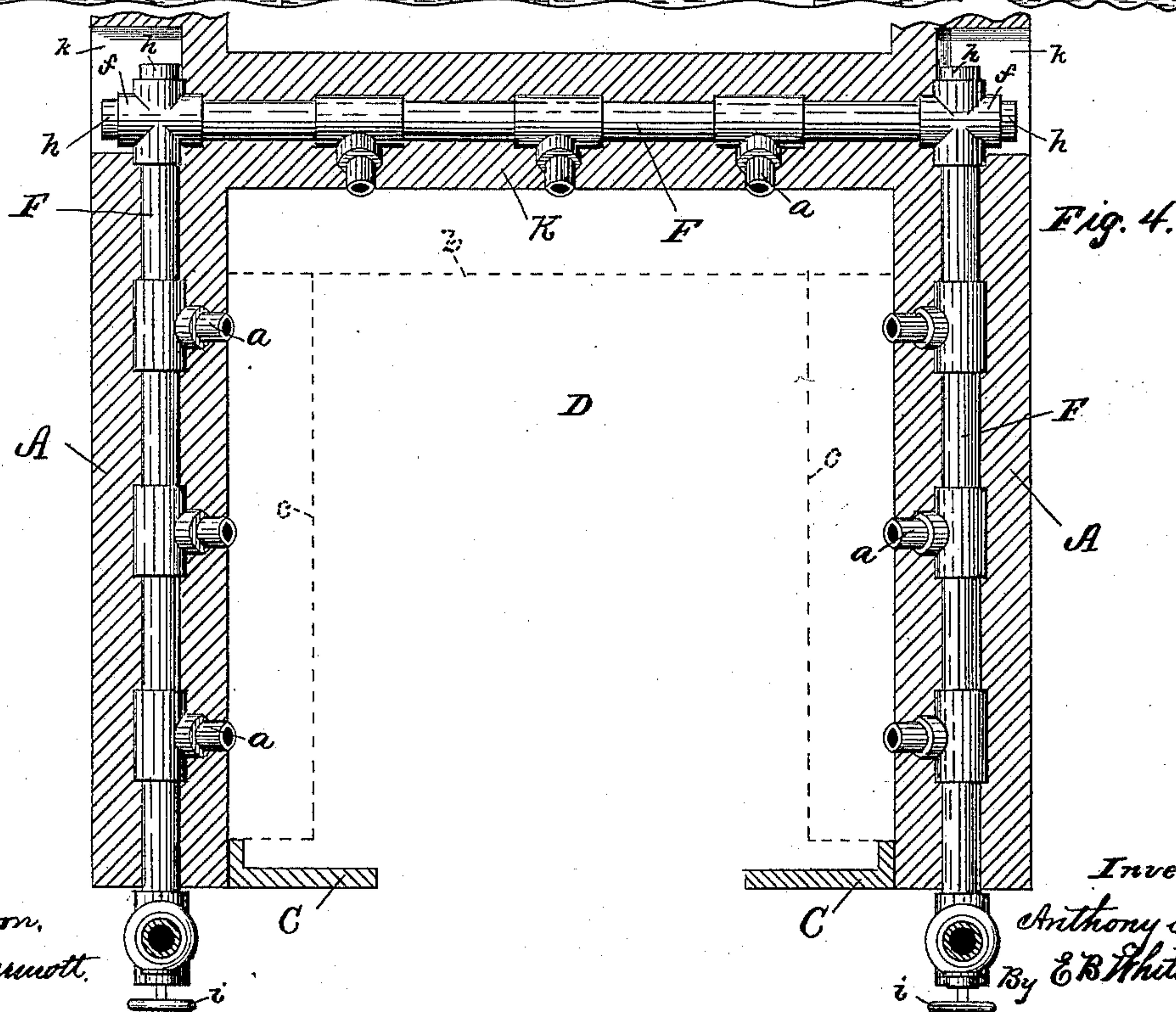
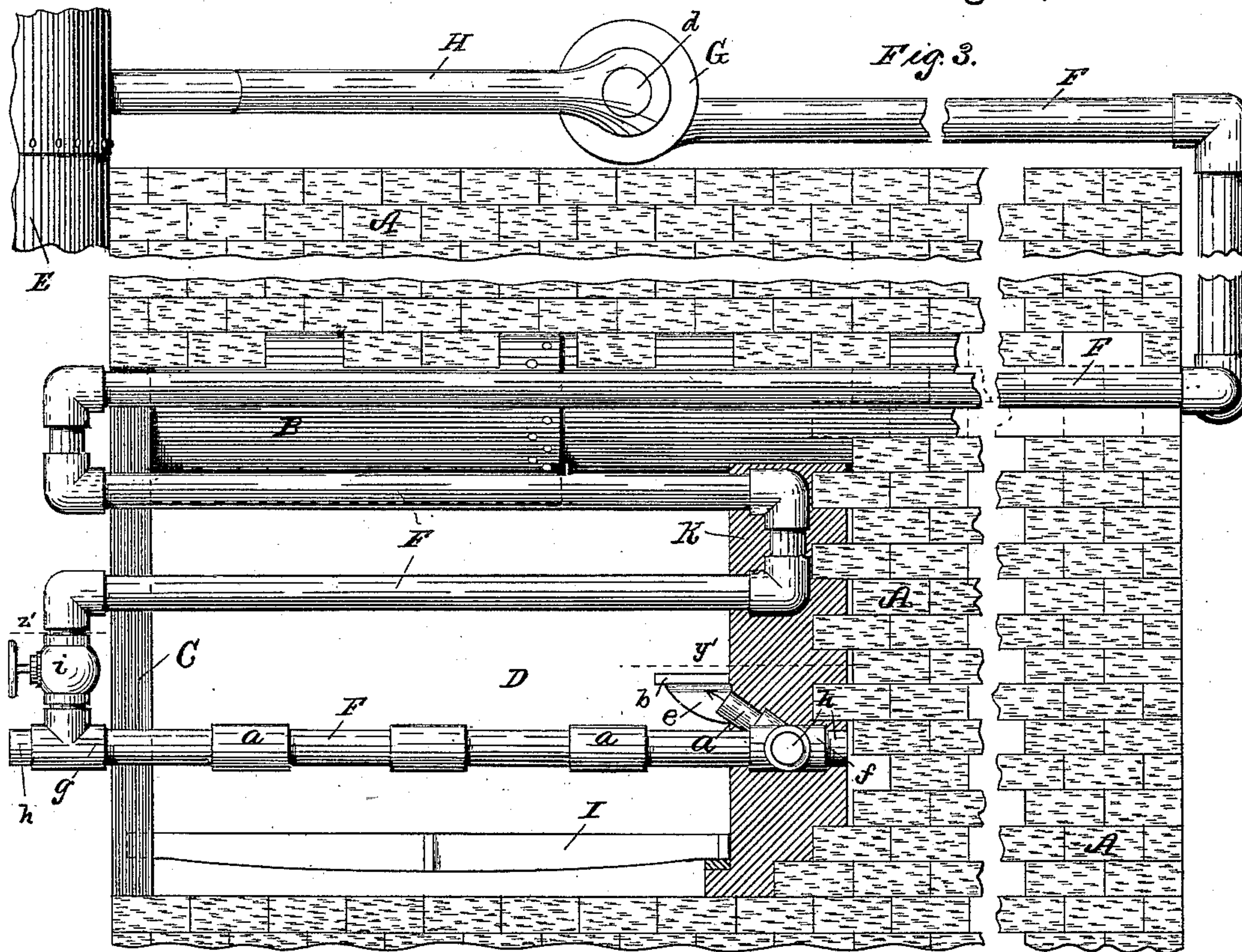
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Attest:

7. Water.

M. L. M. Gennett.

Inventor:

Anthony S. Bell.

R. E. B. Whitmore

Atty.

UNITED STATES PATENT OFFICE.

ANTHONY SNELL, OF ROCHESTER, NEW YORK.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 408,267, dated August 6, 1889.

Application filed February 21, 1889. Serial No. 300,680. (No model.)

To all whom it may concern:

Be it known that I, ANTHONY SNELL, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Steam-Boiler Furnaces, which improvement is fully set forth in the following specification, and shown in the accompanying drawings.

The object of my invention is to improve furnaces, more particularly those used with steam-boilers, so that the smoke and gas created therein shall be more perfectly consumed, the invention being hereinafter fully described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a top view of a boiler-arch and inclosed furnace, a part being broken out to show the interior, the smoke-pipe being horizontally sectioned above the arch and a part being broken out to contract it in length; Fig. 2, a front elevation of a portion of the arch, seen as indicated by arrow *x* in Fig. 1, parts being broken away; Fig. 3, a side elevation of the arch, seen as indicated by arrow *y* in Fig. 1, the figure being contracted in height and length and a portion of the side wall removed to show the interior, the bridge-wall being vertically sectioned, as on the dotted line *z* in Fig. 1; and Fig. 4, a horizontal section of the furnace, taken on the dotted line *x'* in Fig. 2, the conduits being sectioned on the dotted line *z'* in Fig. 3. The section of the wall shown in Fig. 1 is taken on the dotted line *y'* in Fig. 3.

Referring to the parts, A is the arch for the boiler, constructed of brick, for instance; B, a horizontal boiler incased therein; C, the cast-iron front of the furnace, and K the bridge-wall, all of ordinary construction.

D is the interior of the furnace, and E the smoke-pipe thereof.

F is a system of pipes constituting conduits for conveying air or smoke to the interior of the furnace, these pipes being preferably built in the side walls and bridge-wall, as shown.

G is a simple blast-fan of common kind connected with said conduits, and also communicating, by means of a pipe H, with the interior of the smoke-pipe. The conduits are preferably doubled or formed with return-

bends at the two sides of the furnace, as shown in Fig. 3, to the end that the air passing through them shall become heated before entering the furnace. Along their lower sections the conduits are provided with short jet pipes or nozzles *a*, directed toward the interior of the furnace, as shown, and preferably turned, so as to point partially in an upward direction. These jet-pipes are arranged to direct air into the interior of the furnace from three sides thereof, as shown in Fig. 4, including the bridge-wall K. These jet-pipes are preferably arranged to have their exit ends about even with the respective inner faces of the walls of the furnace, and there may be a greater or less number of them, as may be desired. Immediately above the ends of the jet-pipes I provide scattering-plates *c c b*, in such positions that the air or smoke issuing from the jet-pipes shall encounter the under surfaces of the plates and be spread or scattered over the upper surface of the bed of coal resting upon the grate I. By means of these scattering-plates the inflowing jets of air and smoke are spread into thin horizontal sheets, which are projected into the flame over the coal for the purpose of enhancing the combustion and more perfectly consuming the smoke and gas in the furnace.

The fan is provided with an opening *d*, which, when closed, causes the suction to be taken from the interior of the smoke-pipe for the purpose of returning smoke and gas to the furnace to be consumed; or, should it be wished to at times draw only from the outside air, the opening *d* may be uncovered. The scattering-plates may be supported in place by any convenient means—as, for instance, simple brackets or holders *e*.

I provide the conduits with cross-T's *f* at the ends of the bridge-wall, and T's *g* in front of the furnace, so that a tube-cleaner, of some convenient form, may be passed in different directions through the portions of the conduits which hold the jet-pipes, for the purpose of clearing said conduits of any extraneous matter that might accumulate therein. The open ends of the respective T's and cross-T's are closed with simple stoppers *h*, of any kind.

At the rear of the arch the cross portion of

the conduit for connecting the side portions may be outside the arch-wall, as shown in Fig. 1. In front, the sections of the conduits project beyond the ends of the arch-walls, and they are provided at each side with a stop-valve *i*, of common kind. By means of these valves the inflow of air or smoke to the furnace may be controlled, or stopped altogether, without the trouble of stopping the motion of the fan. Openings *k k* are formed in the exterior surface of the side walls of the arch at the location of the respective cross-T's *ff* to uncover the ends of the cross-T's to assist in the matter of clearing the pipes, as above stated.

What I claim as my invention is—

1. A furnace having conduits bent or turned to traverse its side walls in parallel sections backward and forward between the front thereof and the bridge-wall, the last or lowest section at each side being turned into the bridge-wall and joined, the said lowest section being provided with jet-tubes turned within the furnace, the forward couplings of the sections reaching beyond the front of the furnace and provided with gates to open or close the passages to said lowest sections, substantially as shown.

2. A furnace having conduits at its sides

and extending through the bridge-wall to complete the communication between the sides, in combination with recesses *k k* in the outer faces of the respective side walls, the said conduits being formed with openings in front and in said recesses, for the purposes specified.

3. A furnace for a steam-boiler having smoke or air conduits at its sides, and jet-tubes joined to the conduits and turned toward the interior of the furnace, in combination with scattering-plates for the air or smoke issuing from said jet-tubes, and means for driving the air or smoke through the conduits, substantially as described.

4. A furnace for a steam-boiler having smoke or air conduits at its sides, and jet-tubes joined to said conduits, in combination with scattering-surfaces for the smoke or air issuing from said jet-tubes, and a fan for driving the smoke or air through said conduits, said jet-tubes being directed toward the interior of the furnace and in an upward direction, substantially as and for the purpose specified.

ANTHONY SNELL.

Witnesses:

E. B. WHITMORE,
M. D. PHILLIPS.