

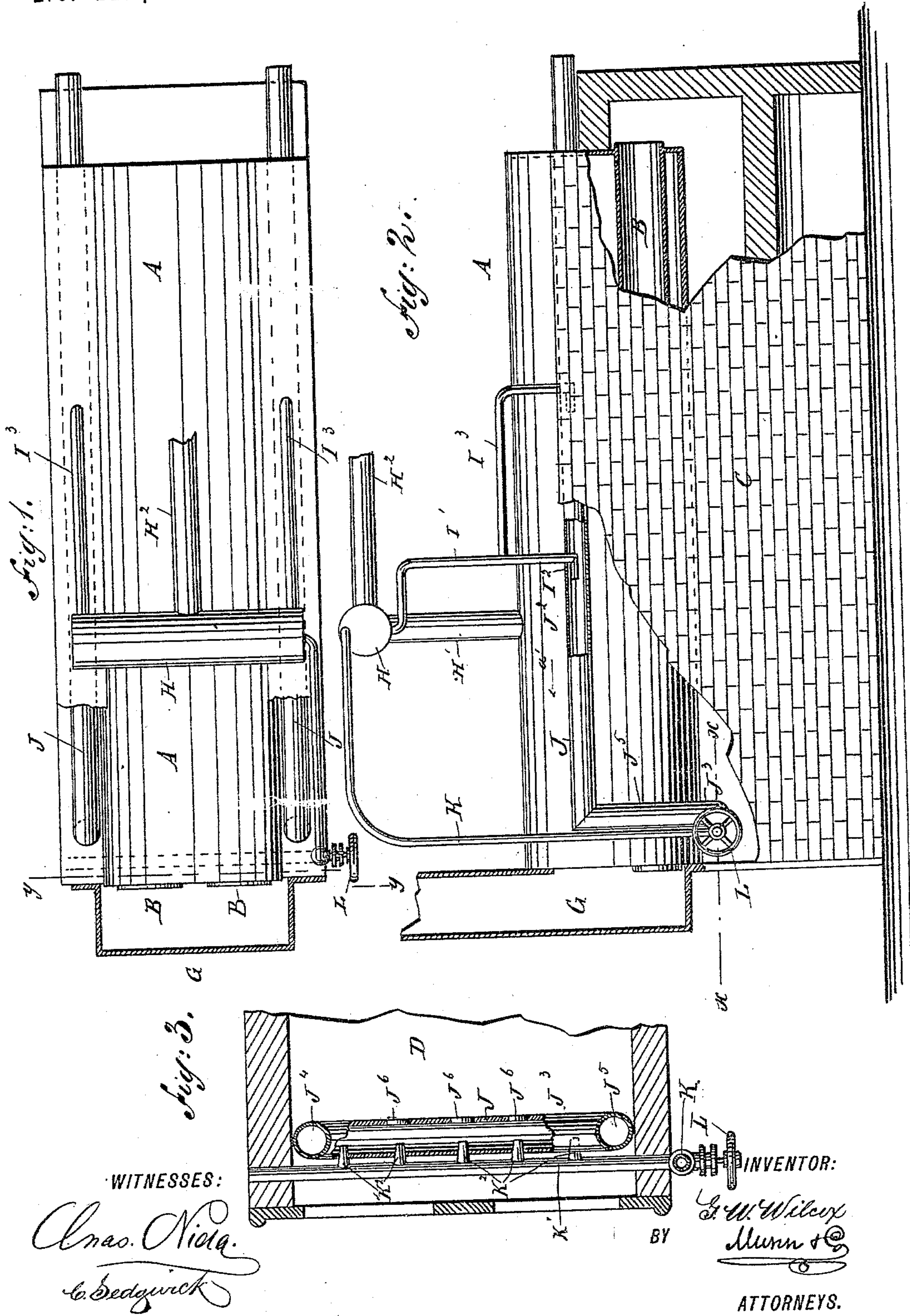
(No Model.)

2 Sheets—Sheet 1.

G. W. WILCOX.
SMOKE CONSUMING FURNACE.

No. 412,007.

Patented Oct. 1, 1889.



WITNESSES:

Chas. Viola.
C. Sedgwick

INVENTOR:

G. W. Wilcox
Munn & Co.

ATTORNEYS.

(No Model.)

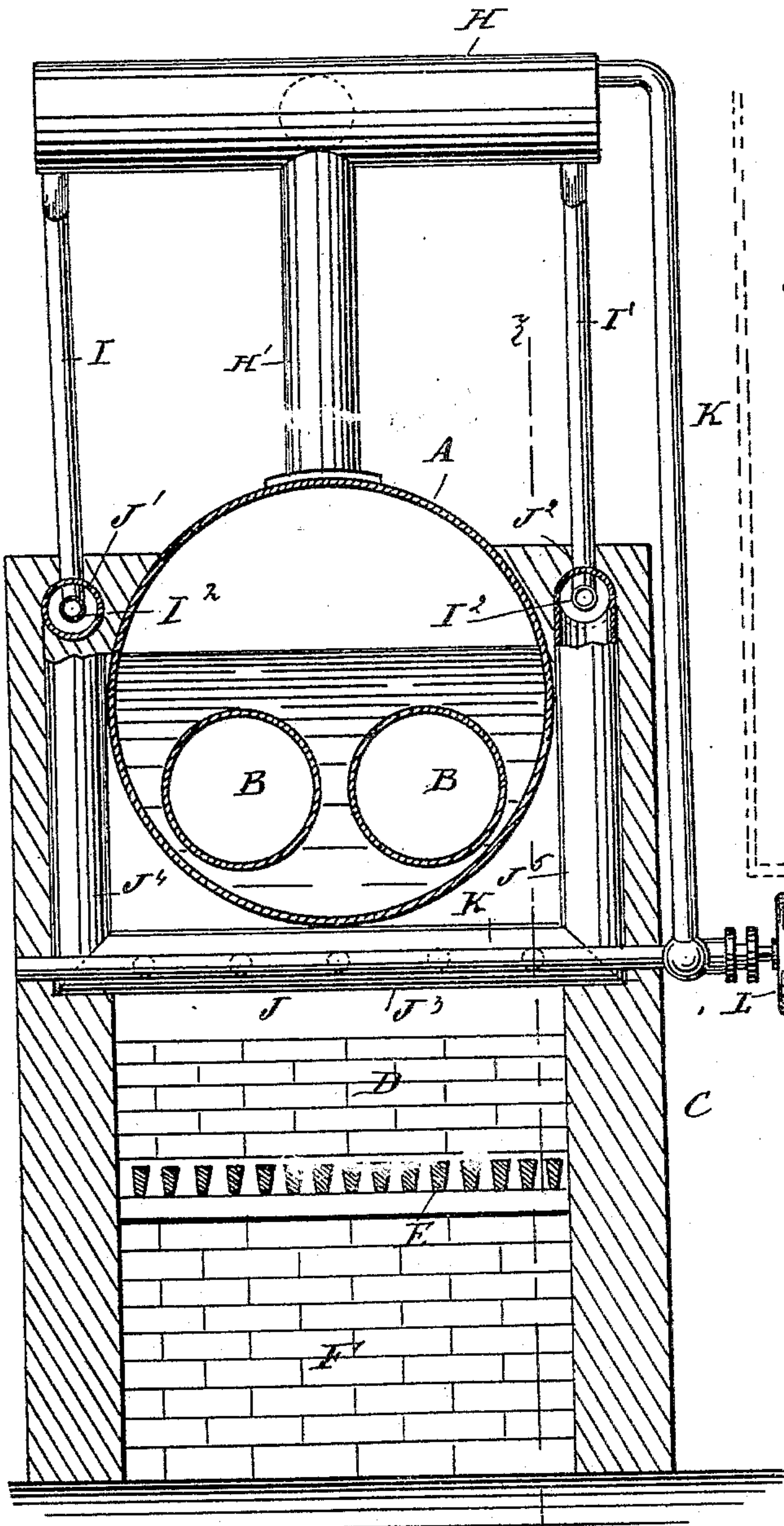
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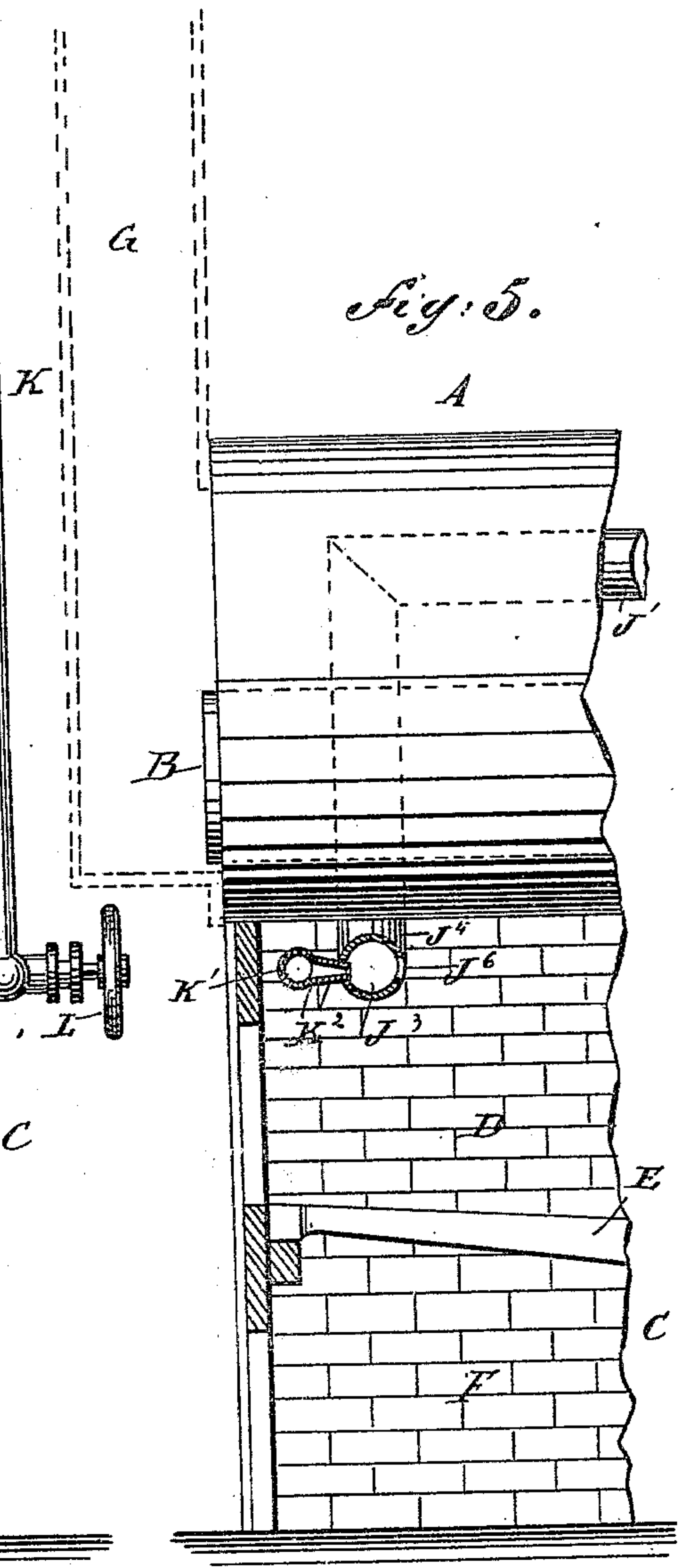
Fig: 4.



WITNESSES:

Chas. Vidor
C. Sedgwick

Fig. 5.



INVENTOR:

G. W. Wilcox

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON WILCOX, OF ST. LOUIS, MISSOURI.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 412,007, dated October 1, 1889.

Application filed April 1, 1889. Serial No. 305,554. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WASHINGTON WILCOX, of St. Louis, in the State of Missouri, have invented a new and Improved
5 Smoke-Consuming Furnace, of which the following is a full, clear, and exact description.

This invention is an improvement in that class of steam-boiler furnaces in which jets of mingled heated air and steam are projected upon incandescent coal within the fire-
10 box.

The features constituting the improvement are hereinafter described in connection with others heretofore employed

15 Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement as applied, and with parts in section. Fig. 2 is a side elevation of the same, with parts in section and parts broken out. Fig. 3 is an enlarged sectional plan view of the improvement on the line *x x* of Fig. 2. Fig. 4
20 is an enlarged sectional end elevation of the improvement on the line *y y* of Fig. 1, and Fig. 5 is a sectional side elevation of the same on the line *z z* of Fig. 4.

30 The boiler A, of any approved construction, is provided with the parallel flues B, and is set in a furnace C, provided with the usual fire-box D, having the grate-bars E, below which is the ash-pit F. The smoke and gases arising from the burning fuel on
35 the grate-bars E pass under the boiler A to the rear end of the same, and to the smoke-flues B, through the same, and into the smoke-box G, leading to the chimney.

40 On top of the boiler A extends a pipe H', supporting the horizontally-extending steam-dome H, from which leads a pipe H², for carrying the steam to the radiators or to the machines to be driven. From the bottom of the steam-dome H extend the pipes I and
45 I', passing into the ends J' and J² of an air-pipe J, located in the fire-space of the furnace alongside the boiler A. The extreme outer ends of the pipe J open to the outside air, and the lower ends of the pipes

I and I' are provided with longitudinally- 50 extending nozzles I², which open forward, as is plainly shown in Fig. 2. From each of the pipes I or I' leads a branch pipe I³, which extends into the respective end J' or J² of the pipe J somewhat in the rear of the pipe I', 55 and is also provided with a nozzle extending in the same direction as the nozzles I² of the pipes I and I'. The middle part J³ of the pipe J extends transversely under the boiler A in the fire-box D. The ends of this middle part J³ connect by the vertical parts J⁴ and J⁵ with the ends J' and J² of the pipe J. In the middle part J³ of the pipe J are arranged a number of apertures J⁶, which open
60 into the fire-box D.

65 From the top of the steam-dome H leads a pipe K, extending forward and downward to terminate in a transversely-extending pipe K', held in front of the middle part J³ of the pipe J in the fire-box D. From the pipe K' 70 lead a number of nozzles K² into the interior of the middle part J³ of the pipe J, directly opposite the openings J⁶. A valve L is held in the end of the pipe K', and serves to shut off the steam from the dome H to the pipe K 75 whenever desired.

The operation is as follows: When the fuel on the grate-bars E is burning and steam is up in the boiler A, if the operator opens the valve L the steam from the dome H passes 80 through the pipes I and I' into the ends J' and J² of the pipe J. The steam entering the ends J' and J² passes in the direction of the arrow *a'*—that is, toward the front of the boiler A—so as to create a suction in the rear 85 parts of the said pipe ends J' and J², whereby air is drawn into the same from the outside, and mingles with the steam from the dome H. The mixture of steam and air passes from the pipe ends J' and J² through the vertical parts J⁴ and J⁵ into the middle part J³, 90 from which the mixture is injected through the openings J⁶ into the fire-box. This discharge is aided by the steam-jets from the nozzles K², which drive or project the mingled 95 air and combustible gases to the extreme back portion of the grate—a point which they might otherwise not reach.

The introduction of steam into the pipes J not only induces air-currents therein, but also prevents the pipes from burning.

What I claim is—

- 5 The combination of the supplementary steam-conducting pipe K K', having nozzles K², and valve L, with the steam and air con-

ducting-pipes J J⁵ J³, arranged as specified, the steam-pipes I I' I², and the fire-box, boiler, and steam-dome, all as shown and described. 10
GEORGE WASHINGTON WILCOX.

Witnesses:

LEO BENZ,
GEO. NORDEN.