

(No Model.)

2 Sheets—Sheet 1.

C. E. DAVIS.

LOCOMOTIVE SMOKE CONSUMER.

No. 340,985.

Patented May 4, 1886.

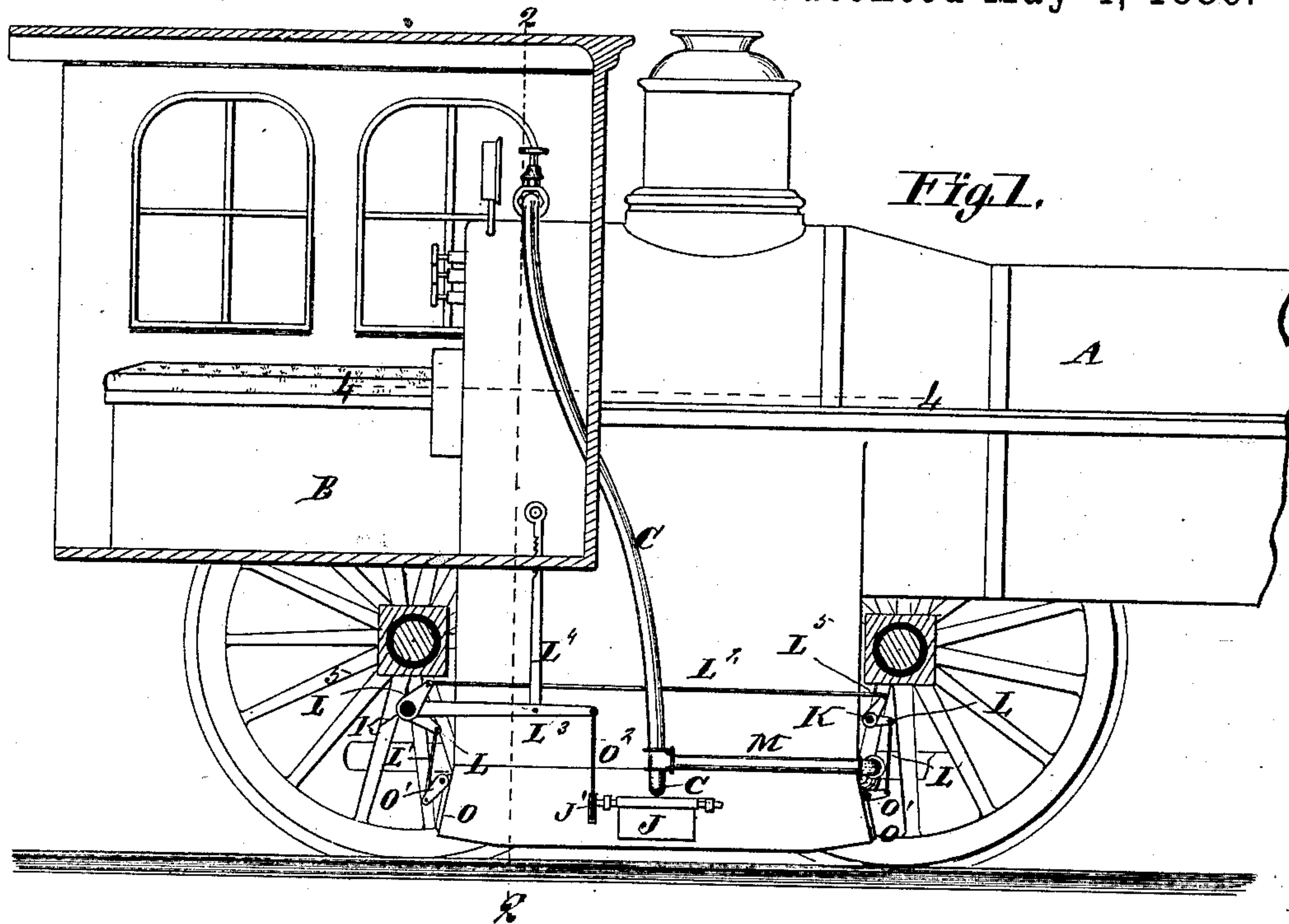
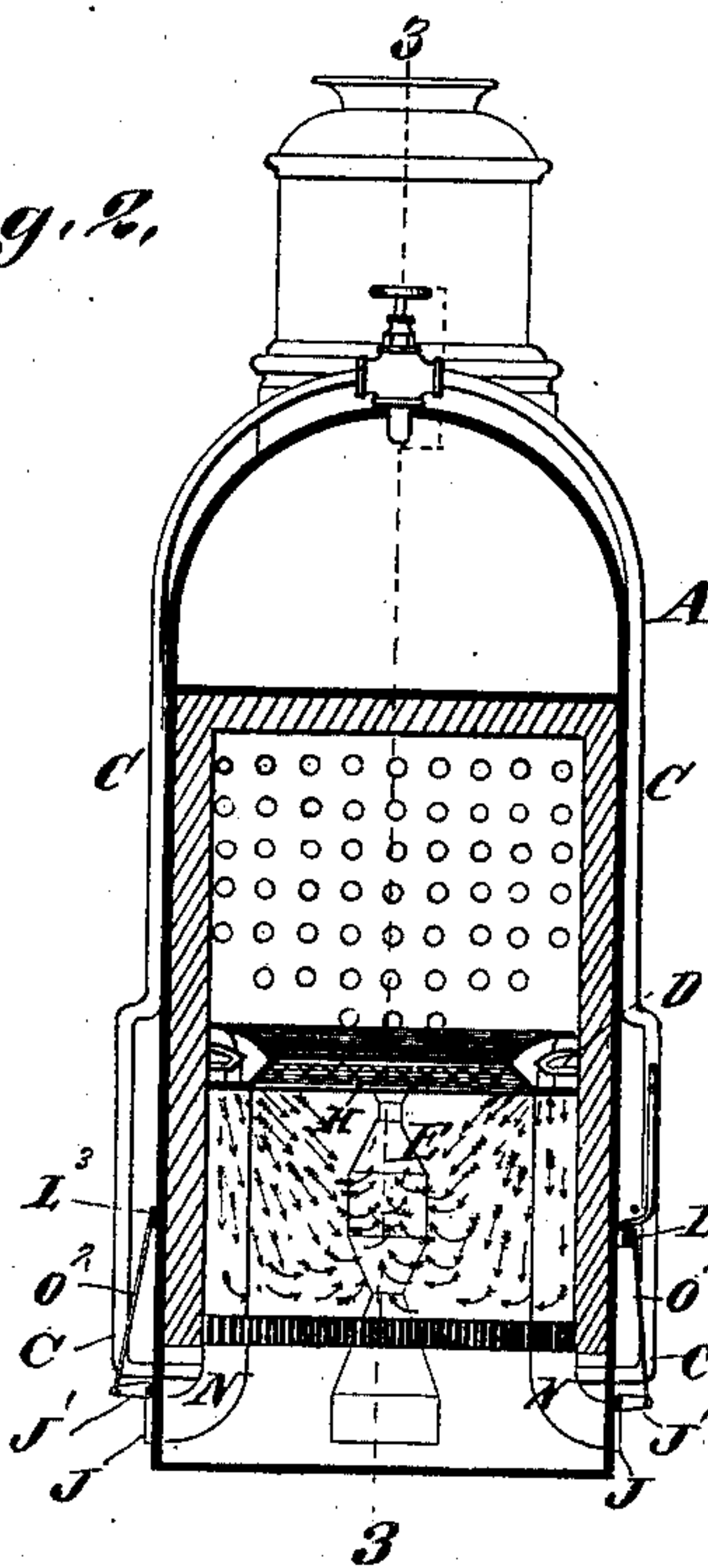


Fig. 2.



Attest:

F. A. Hopkin's
Genl. Wheelock

Inventor:

Corbin E. Davis

By Knight Bros
Attys

(No Model.)

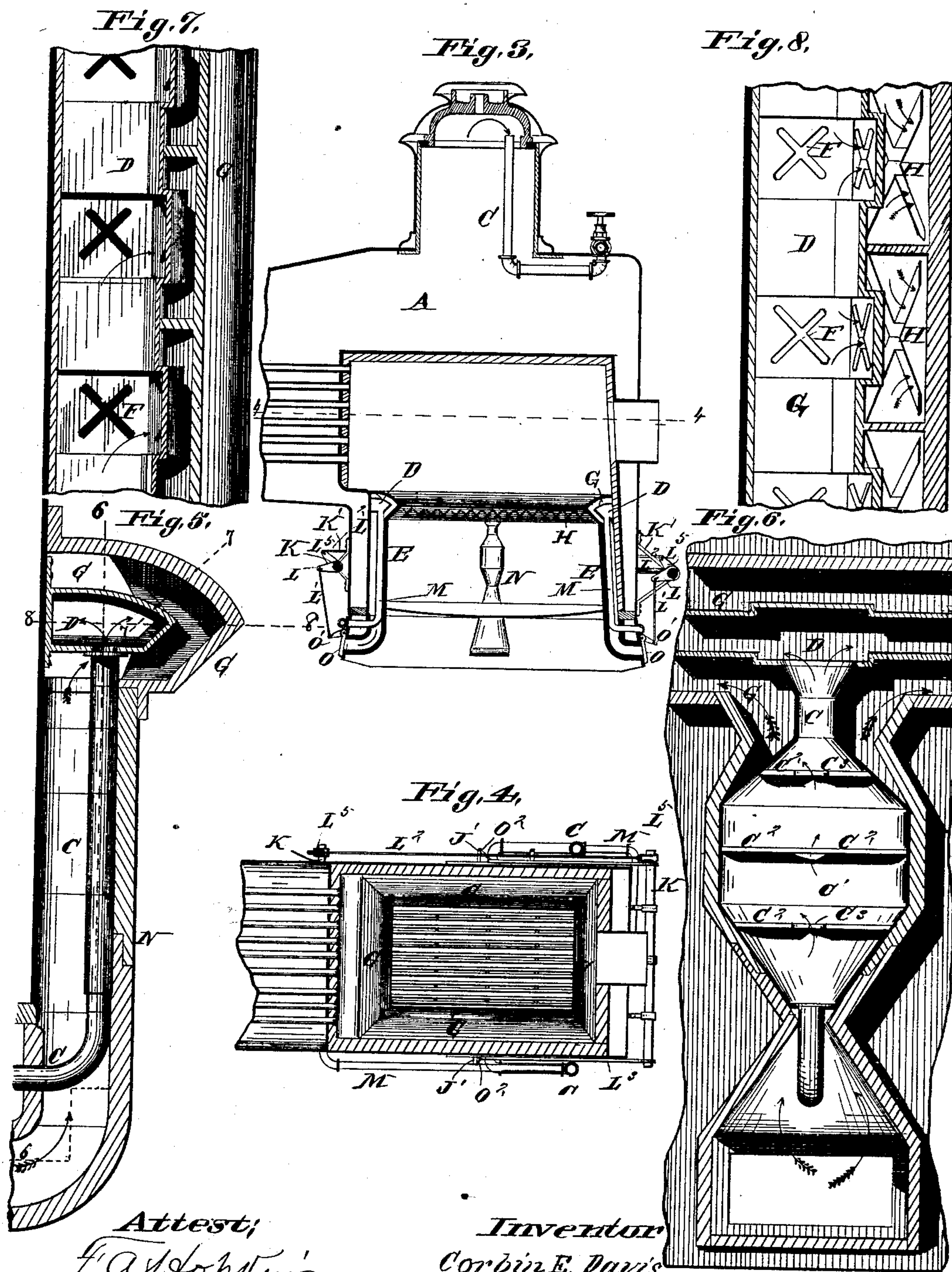
2 Sheets—Sheet 2.

C. E. DAVIS.

LOCOMOTIVE SMOKE CONSUMER.

No. 340,985.

Patented May 4, 1886.



Attest,
F. A. Hopkin
Gen'l. Wheelock.

Inventor
Corbin E. Davis,
By Knight & Bros
Attys.

UNITED STATES PATENT OFFICE.

CORBIN E. DAVIS, OF ST. LOUIS, MISSOURI.

LOCOMOTIVE SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 340,985, dated May 4, 1886.

Application filed August 15, 1885. Serial No. 174,489. (No model.)

To all whom it may concern:

Be it known that I, CORBIN E. DAVIS, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Locomotive Smoke-Consumers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a side elevation of part of a locomotive with my improvement applied. Fig. 2 is a vertical transverse section taken on line 2 2, Fig. 1. Fig. 3 is a detail vertical longitudinal section taken on line 3 3, Fig. 2. Fig. 4 is a detail horizontal longitudinal section taken on line 4 4, Figs. 1 and 3. Fig. 5 is an enlarged section of the vertical steam and air duct or flue. Fig. 6 is an enlarged horizontal section taken on line 6 6, Fig. 5. Fig. 7 is a similar view taken on line 7 7, Fig. 5. Fig. 8 is a similar view taken on line 8 8, Fig. 5.

My invention relates to an improvement in locomotive smoke-consumers; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, A represents part of a locomotive having the usual cab, B.

C represents steam-pipes forming a connection between the top of the boiler and a steam-chamber, D. There are preferably two pipes—one on each side of the boiler—as shown in Fig. 2, and they enter vertical air flues or ducts N, located at the sides of the fire-chamber and ash-pit, as shown in Figs. 1, 2, and 3. The pipes extend up through these ducts or flues and communicate with a chamber, D, as stated, into which they discharge the steam which escapes through openings F (see Figs. 7 and 8) into an air-chamber, G, located at the upper end of the ducts or flues N.

M represents branch pipes leading from the pipes C to air flues or ducts E, located at the front and back of the boiler. These flues E are constructed exactly the same as the flues N, and likewise communicate with the air-chamber D, the pipes M extending up through the flues E and communicating with the air-chamber D. The air and steam become thoroughly mixed in the chamber G, and from it they escape through openings H into the fire-chamber, as shown by the arrows in Fig. 2. The air enters these ducts or flues N and E at

their lower ends, which are open, except when closed by dampers or valves J and O, provided with cranks J' and O', for opening them, through means of the device I have shown or some other suitable device, the device I have shown consisting of a rock-shaft, K, supported by brackets K', securing it to the boiler, and provided with cranks L, connected to the cranks of the valves or dampers O by rods L'.

There is a rock-shaft provided with a crank, L, on each side of the boiler-leg, as shown in Fig. 1, and these rock-shafts are provided with another set of cranks, L², connected by a rod, L². Extending from one of these rock-shafts is a lever, L³, to which is pivoted a notched bar, L⁴, that extends up into the cab, as shown in Fig. 1, and by which the shafts may be rocked through means of the described connection to open and close the valves.

One of the levers or dampers J is connected to the free end of the lever L³, and the other valve or damper J is connected to the free end of a similar lever, (also marked L³,) this connection being made by means of rods O², which are made fast at their upper ends to the levers and at their lower ends to the cranks J', which are connected to the valves J.

The notches on the bar L⁴ engage with the bottom of the cab to hold their valves in their open position, and when it is desired to close the valves it is only necessary to release the bar, when the valves will fall shut. By this arrangement all the valves or dampers of the four flues mentioned are operated simultaneously by a person in the cab.

The pipes C and M have enlargements C' within the flues N and E, as shown in Fig. 6, and in these enlargements I prefer to locate two or more diaphragms, C², with perforations C³ on a vertical line, as shown in said figure, so that the steam will have to traverse every part of this enlargement of the pipe, so as to thoroughly heat the pipe, and thus heat the air that passes up the flues.

As the steam flows out through the openings F and H into the fire-box, it causes a vacuum, and consequently a circulation of air up through the flues, as shown by arrows.

In operation the steam descending from the top of the dome enters the air-funnels at the bottom of the fire-box, and then enters a combustion-chamber, in which it is detained in

passing through the three diaphragms until it is decomposed. It then passes into the chambers which are surrounded with air, and as it exhausts it carries air with it into the fire-box, and when it comes in contact with the natural draft it ignites and insures a perfect combustion of the fuel, so that the vast amount of carbon that is usually thrown off in smoke is utilized in my furnace for the generation of steam.

Combined with the economic consumption of the carbon usually expelled in smoke, my invention insures a more perfect consumption of the fuel in the furnace and greater resultant heat and production of steam.

I claim as my invention—

1. The combination of the air-flues, steam pipes passing through the air-flues, perforated steam-chamber located at the ends of the steam-pipes, and perforated air and steam chamber located at the upper ends of the air-flues and surrounding the steam-chamber, the said steam-pipes forming a communication between the boiler and said perforated chamber, substantially as and for the purpose set forth.

2. The combination of the air and steam chamber located at the top of the flues, the perforated steam-chamber located within the air-chamber, steam-pipes forming a communication between a boiler and said steam-chamber, and dampers or valves for closing the air-flues, substantially as and for the purpose set forth.

3. The combination of the perforated air

and steam chamber located at the upper end of the flues, perforated steam-chamber located within the air-chamber, steam-pipes forming a communication between a boiler and said steam-chamber, and having enlargements within the air-flues, and perforated diaphragms located in the enlargements of the steam-pipe, substantially as set forth.

4. The combination of the air ducts or flues, perforated chamber located at the upper ends of said flues, perforated steam-chamber located within said air-chamber, steam-pipes forming a communication between the boiler and said steam-chamber, valves at the mouths of the said air-flues, rock-shafts connected to one set of the said valves by cranks and rods, levers secured to the rock-shafts and connected by cranks and rods to the other set of said valves, and a lifting-bar, L^4 , connected to one of said levers, all substantially as and for the purpose set forth.

5. The combination of the air flues or ducts, perforated chamber located at the upper ends of said flues, perforated steam-chamber located within said air-chamber, and pipes forming a communication between the boiler and the said steam-chamber, said pipes extending through the air flues or ducts, where they are provided with enlargements, substantially as and for the purpose set forth.

CORBIN E. DAVIS.

In presence of—

BENJN. A. KNIGHT,
GEO. H. KNIGHT.