

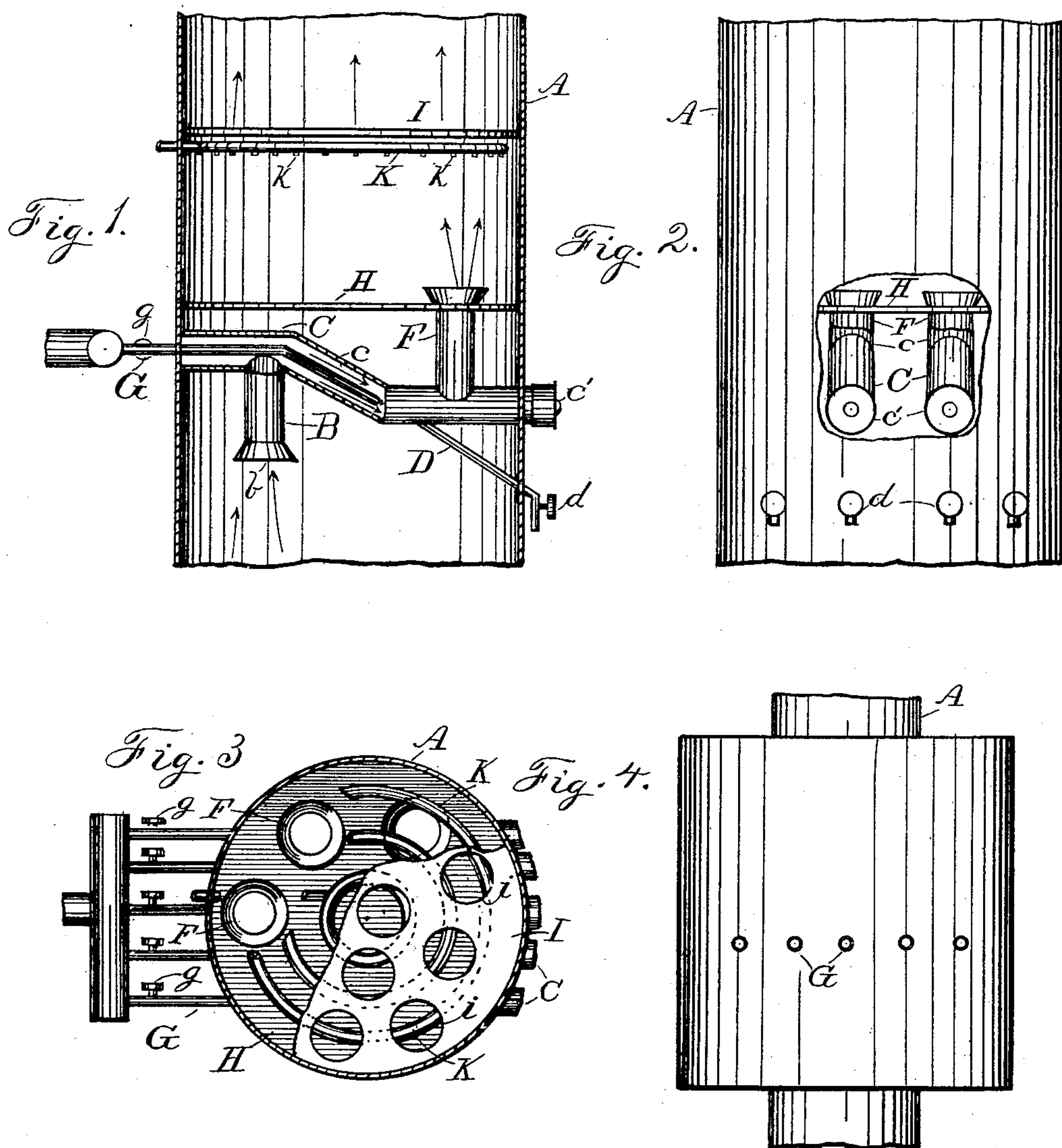
No. 703,048.

Patented June 24, 1902.

J. S. DONOHUE.
SMOKE CONSUMER.

(Application filed Mar. 26, 1902.)

(No Model.)



Witnesses:
Thomas P. Simpson.
W. H. Allman.

Inventor:
James S. Donohue
By *Chas. D. Smith,*
Attorney.

UNITED STATES PATENT OFFICE.

JAMES S. DONOHUE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
OF ONE-HALF TO PATRICK I. MORAN, OF GEORGETOWN, DISTRICT OF
COLUMBIA.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 703,048, dated June 24, 1902.

Application filed March 26, 1902. Serial No. 99,986. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. DONOHUE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Smoke-Consumers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to devices for preventing the escape of smoke from chimneys and smoke-stacks by which the carbon-charged gases are either consumed or the sooty element is eliminated from them, so that the gases when discharged from the chimney are substantially colorless. The means by which this is accomplished are fully illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of part of a smoke-stack, showing a side elevation, partly in section, of a portion of the invention located therein. Fig. 2 is a front elevation of a smoke-stack, partly broken away and disclosing the arrangement of parts within. Fig. 3 is a plan of the upper diaphragm, partly broken away to show the steam-pipes just beneath and the lower diaphragm; and Fig. 4 is an exterior rear view of my improvement adapted to a smoke-channel of small diameter.

Like letters of reference denote corresponding parts in the different views.

The letter A indicates a smoke-stack, chimney, or other smoke-channel. One or more approximately vertical short flues B, having a flaring mouth *b* opening downward, is placed in the stack. The upper end of the flue B opens into a cross-flue C, having preferably an inclined section *c* and a cap *c'* on the end which projects through the stack. A drip-pipe D taps the flue C about its middle or just beyond the incline *c* and, extending through the stack, is provided with a stop *d*.

F is an exit-flue opening upward from the flue C through the diaphragm H, which extends entirely across the stack. As this diaphragm is to compel the smoke to pass through

the flues B it is evident that it may be located below the cross-pipes, and I do not limit its location to that shown in the drawings. A steam-pipe G for each cross-flue enters the stack and the cross-flue and terminates at the bottom of the incline *c*. Each steam-pipe is provided with a valve *g*. Above the diaphragm H are arranged either crosswise or in a circle steam-pipes K, having vents *k* opening downward, and above these another diaphragm I, provided with openings *i*.

The lower system of flues and pipes should be located near to the fire and the upper system about the width of the stack above the lower.

In operation the heated vapor from the fire enters the flues B and passes into the cross-flues C, where it is treated to the jet of steam, commingled with which it passes through flues F into the space above the diaphragm H. Here it is again subjected to steam injected through a number of small vents *k*, and finally ascending it passes out through openings *i* into the upper part of the stack free from all visible coloring-matter.

The lower level of flue C is cleaned through the opening covered by the cap *c'*, and any excess of moisture from the steam, as well as particles of non-combustible matter, is carried off by the drip-pipes D.

The lower system of flues and pipes is effective in many conditions without the upper system; but when combined with the upper system the gases from the lowest grades of coal are rendered substantially colorless.

Having described the invention, what I claim, and desire to secure, is—

1. A smoke-consumer comprising a smoke-stack, approximately vertical flues in said stack, cross-flues connecting therewith, steam-pipes to discharge steam into said cross-flues in the direction of the draft, a diaphragm across the stack near the cross-flues, and discharge-flues connecting said cross-flues, at a point beyond the steam-discharge, with the space above said diaphragm, as described.

2. A smoke-consumer comprising a smoke-stack, approximately vertical flues in said stack, cross-flues connecting therewith, drip-

pipes connected with said cross-flues steam-pipes to discharge steam into said cross-flues in the direction of the draft, a diaphragm across the stack near the cross-flues and discharge-flues connecting said cross-flues, at a point beyond the steam-discharge with the space above said diaphragm as described.

3. In a smoke-consumer, a smoke-stack, vertical flues in said stack, cross-flues connecting therewith, an inclined section in each of said cross-flues, steam-pipes opening into said cross-flues, a diaphragm across the stack and discharge-flues connected with said cross-flues at a point beyond their inclined sections and opening above said diaphragm, substantially as herein set forth.

4. A smoke-consumer comprising a smoke-stack, vertical flues therein, cross-flues con-

nected therewith and extending through the stack, caps on the outer ends of said cross-flues, drip-pipes tapping said cross-flues, steam-pipes opening into said cross-flues to discharge steam in the direction of the draft, discharge-flues connecting with said cross-flues and opening above a diaphragm, steam-pipes above said diaphragm vents in said steam-pipes and an upper perforated diaphragm above said steam-pipes substantially as herein set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES S. DONOHUE.

Witnesses:

P. I. MORAN,
GEORGE BUCKLER.