

No. 765,534.

PATENTED JULY 19, 1904.

D. D. WILLIAMS.  
SMOKE CONSUMER.

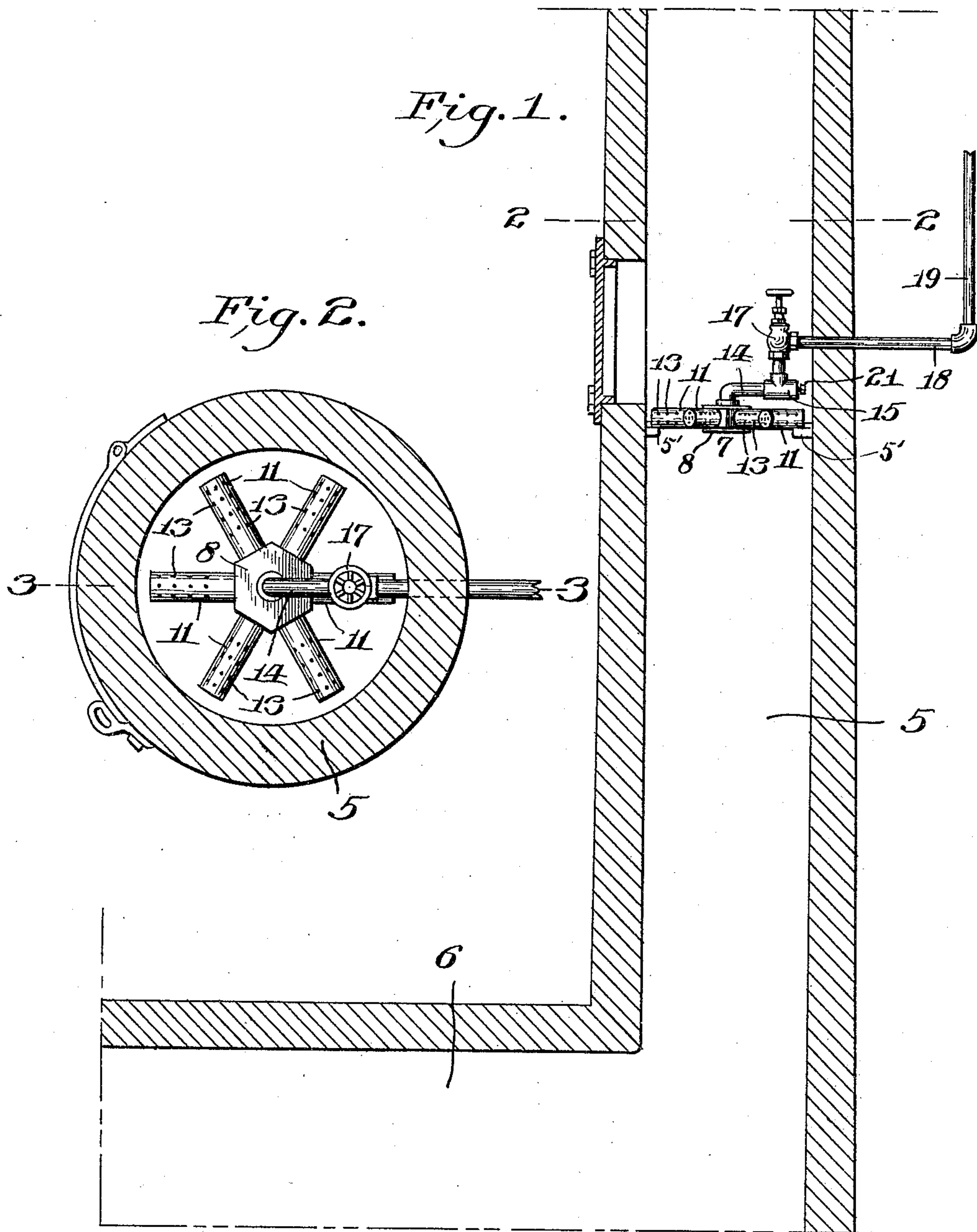
APPLICATION FILED JAN. 21, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*

*Fig. 2.*



WITNESSES:

*W. H. Samble*  
*W. H. Canby*

INVENTOR

*Douglas D. Williams*  
BY  
*A. V. Grouse*  
ATTORNEY.

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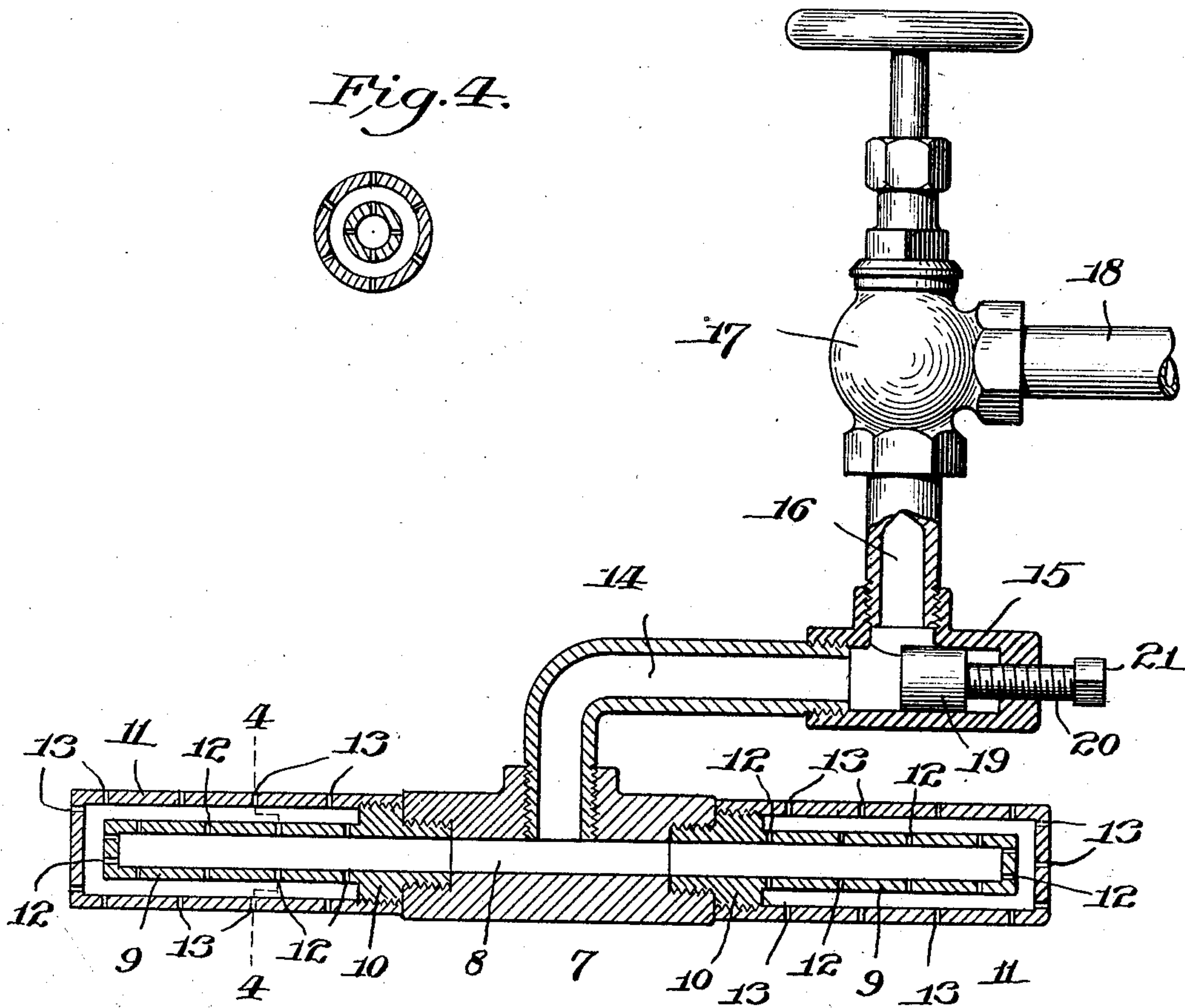
APPLICATION FILED JAN. 21, 1904.

NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 3.*

*Fig. 4.*



WITNESSES:

*W. H. Samble*  
*W. A. Leuby*

INVENTOR

*Douglas D. Williams*  
BY  
*A. V. Jones*  
ATTORNEY.



# UNITED STATES PATENT OFFICE.

DOUGLAS D. WILLIAMS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR  
OF TWO-THIRDS TO FRANCIS DOUGHERTY, OF PHILADELPHIA, PENN-  
SYLVANIA.

## SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 765,534, dated July 19, 1904.

Application filed January 21, 1904. Serial No. 189,944. (No model.)

*To all whom it may concern:*

Be it known that I, DOUGLAS D. WILLIAMS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

This invention relates to smoke-consumers, and has for its object to provide a more simple and efficient means for consuming the smoke as it passes through the smoke-stack leading from the furnace than has been heretofore attained.

With this object in view the invention consists in the novel construction and combinations of parts which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a sectional elevation of a smoke-stack provided with my invention. Fig. 2 is a horizontal section, as on the line 2 2 of Fig. 1, enlarged. Fig. 3 is a vertical section, as on the line 3 3 of Fig. 2, omitting the smoke-stack and enlarged. Fig. 4 is a sectional detail as on the line 4 4 of Fig. 3.

5 designates a smoke-stack, and 6 the passageway leading to the base thereof from the fire-box of the furnace, supporting devices 5' being extended from the interior wall of the smoke-stack to support the arms of the burner, as will more fully appear.

Located within the stack 5 is a burner 7 of the following construction: 8 is a centrally-arranged chamber, into the vertical walls of which are screwed the inner ends of a series of hollow radiating arms 9, which open into said chamber, and screwed onto enlargements 10 of the arms 9 are the inner ends of another series of hollow arms 11, which surround and inclose the arms 9, so as to afford a space therebetween. The arms 9 are provided with perforations 12 to afford communication between the interior thereof and the interior of the arms 11, and the latter arms are provided with perforations 13 to afford communication between the space between the arms 9 and 11 and the interior of the smoke-stack, as shown

in the drawings. Screwed into the top of chamber 8 and opening into the same is a pipe 14, which extends horizontally a slight distance above one of the radiating arms 11. The outer end of the pipe 14 is provided with a T 15, from which raises a vertical pipe 16, which is arranged directly above the arm 11 under the pipe 14. The top of the pipe 16 is provided with a valve 17 of well-known construction in communication with a pipe 18, extending horizontally through the wall of the stack. Connected to the pipe 18 is the lower end of a pipe 19, which may be connected with any suitable oil or gas supply.

Slidingly fitted within the horizontal member of the T 15 is a valve-head 19, from which projects a screw-threaded stem 20, which extends through and is fitted to internal threads in the outer end of the T 15. The outer end of the stem 20 is provided with a head 21, by means of which the stem 20 may be turned to move the valve 19 back and forth beneath the vertical member of the T 15, and thereby regulate the size of the opening between the pipes 14 and 16.

When the pipe 19 is connected with a source of oil-supply, the oil passes from the pipe 19 through the valve 17 and into the pipe 16 and from the pipe 16 through the valve 19 and into the pipe 14, the chamber 8, and arms 9 and 11, and having been generated into gas by the heat of the burner it passes through the perforations 13 and is burned. The valve 17 is adjusted to admit the necessary quantity of oil to the pipe 16, in which it is heated by the flame of the underlying arm 11, and the valve 19 is adjusted to admit the necessary quantity of heated oil to the pipe 14, from which it passes into the chamber 8 and arms 9 and 11.

By the arrangement of parts hereinbefore described I secure a thorough vaporization of the oil before burning and a very effective burner for consuming the smoke as it passes through the smoke-stack from the furnace. The arrangement of the central chamber 8 and radiating arms 9 and 11 insures an even distribution of the gas throughout the entire



burner and provides a flame through which all the smoke must pass and be consumed thereby and yet does not materially interfere with the passage of the products of combustion through the stack.

By the employment of my invention the draft through the stack and furnace is greatly increased, which results in a saving of furnace-fuel.

I claim—

1. The combination of a smoke-stack leading from a furnace and provided with supporting devices extending internally from the walls of the stack, a burner wholly disposed within the smoke-stack, said burner being formed with radially-disposed arms resting at their ends upon said supporting devices, said supporting devices extending inwardly from the interior wall of the stack, a pipe connecting the burner with a source of gas or oil supply and said arms provided with perforations to evenly distribute the flame through the cross-sectional area of the stack.

2. The combination of a pipe leading from a source of oil or gas supply, a burner comprising a central chamber with which said pipe is connected, and a series of hollow perforated arms radially disposed about and extending from said central chamber, and a second series of hollow arms disposed radially of the central chamber, and each surrounding and inclosing an arm of the first-mentioned series, and a valve for controlling the supply of fuel.

3. In a device of the character described, the combination of a pipe leading from a source of fuel-supply, a burner comprising a central chamber and connected to said pipe, a series of hollow perforated arms radially disposed about and extending from said central chamber, said pipe being disposed above one

of said radial arms, a second series of hollow perforated arms disposed radially of the central chamber and each inclosing one arm of the first-mentioned series, and a valve disposed within said pipe for controlling the supply of fuel.

4. In a device of the character described, the combination of a pipe leading from a source of fuel-supply, a burner comprising a central chamber connected to said pipe, a series of hollow perforated arms screw-threaded into the vertical walls of said central chamber and radially disposed about the same, said arms having each an enlarged threaded portion, and a second series of hollow perforated arms surrounding and inclosing the arms of the first-named series, and engaging the enlarged screw-threaded portions of the arms of the first series.

5. In a device of the character described, a burner comprising a central chamber, a series of arms radially disposed about the central chamber and connected thereto, said arms each being provided with an enlarged screw-threaded portion, a second series of hollow perforated arms, each arm of the second series surrounding and inclosing an arm of the first-named series and connected to the enlarged screw-threaded portion thereof, a pipe disposed above and centrally connected to the central chamber, said pipe extending in the vertical plane of one of the radially-disposed arms, and containing a valve, substantially as described.

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

DOUGLAS D. WILLIAMS.

Witnesses:

ANDREW V. GROUPE,  
RALPH H. GAMBLE.