No. 709,948. Patented Sept. 30, 1902.

F. W. WERNER.

MEANS FOR PROMOTING COMBUSTION.

(Application filed Apr. 21, 1900.)

(No Model.)

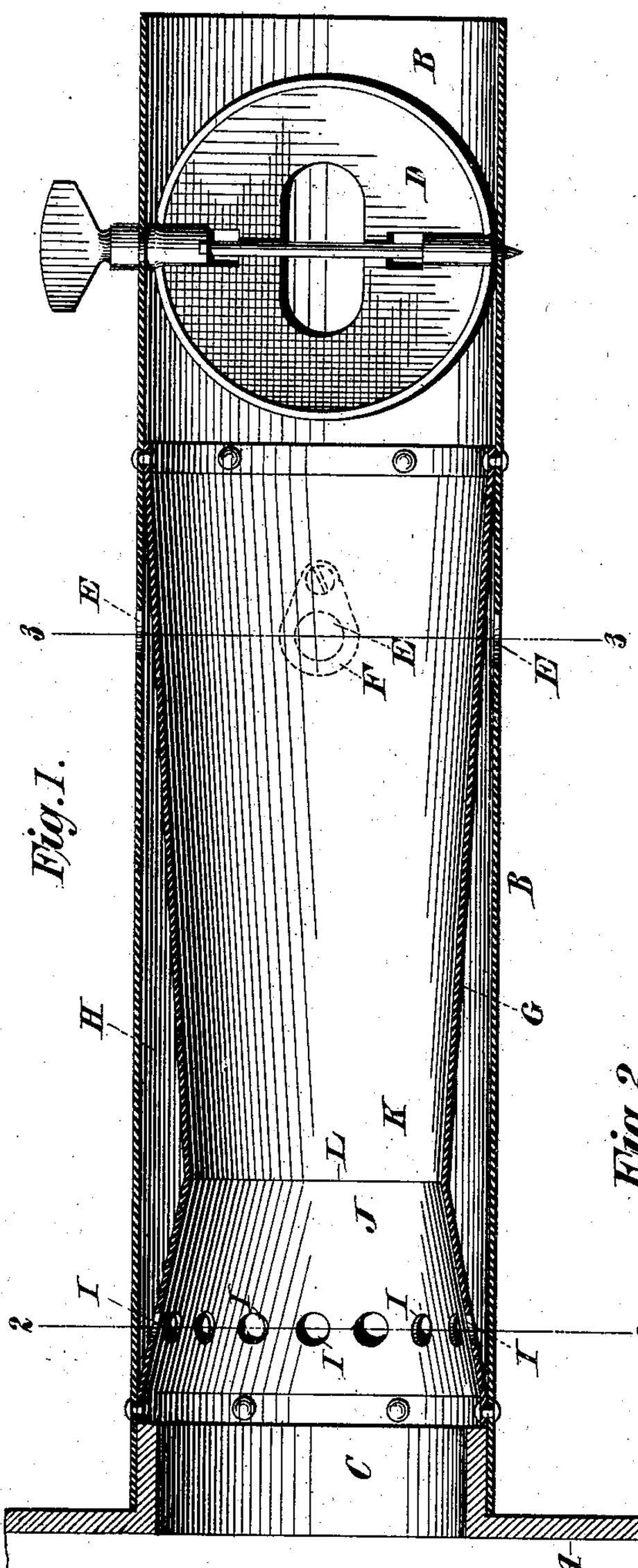

Fig. 1.

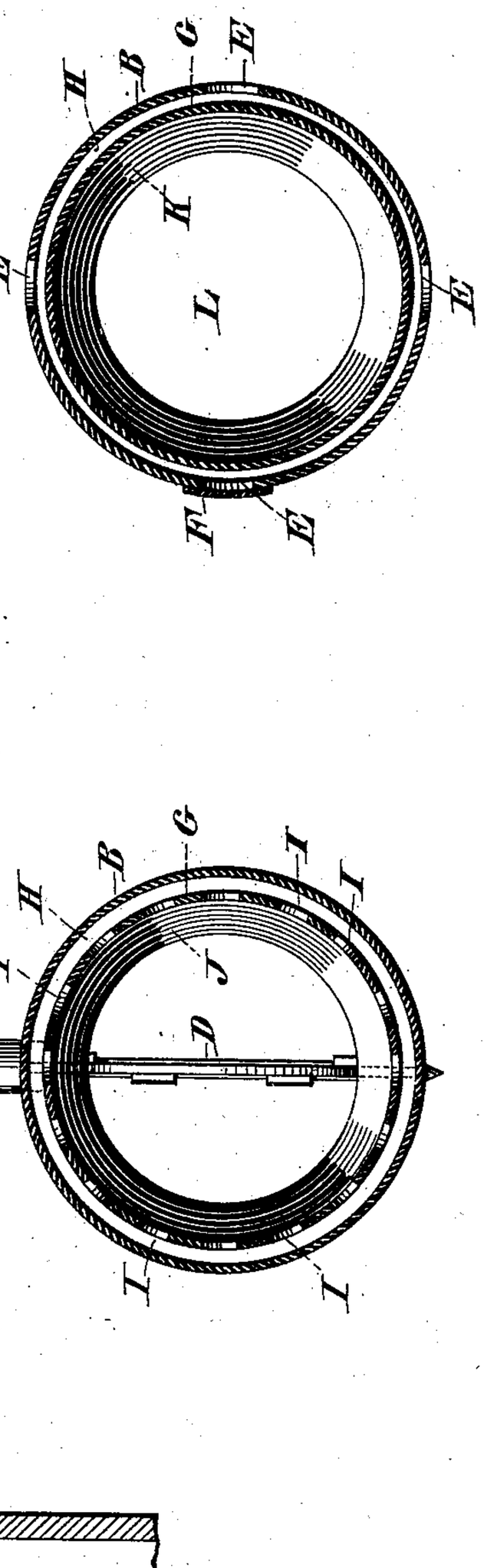

Fig. 3.

Fig. 2.

WITNESSES:

Gustave Dieterich.

Edwin H. Dieterich.

INVENTOR

Frederick W. Werner

BY Chas. C. Gill

ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK W. WERNER, OF HEMPSTEAD, NEW YORK.

MEANS FOR PROMOTING COMBUSTION.

SPECIFICATION forming part of Letters Patent No. 709,948, dated September 30, 1902.

Application filed April 21, 1900. Serial No. 13,732. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. WERNER, a citizen of the United States, and a resident of Hempstead, in the county of Nassau and State of New York, have invented certain new and useful Improvements in Means for Promoting Combustion, of which the following is a specification.

The invention relates to improvements in means for promoting combustion; and it consists in the novel features, arrangement, and combinations of parts hereinafter described, and particularly pointed out in the claims.

The invention comprises novel means for supplying air within the pipe or flue constituting the exit for the products of combustion from a stove or furnace. In the preferred embodiment of the invention the section of the pipe or exit-flue adjacent to the stove or furnace is provided with an interior annular air-chamber having inlets for air at its end farthest removed from the stove or furnace and provided with outlets for air at its end nearest to the stove or furnace, whereby the air may be brought into contact with extended heating-surfaces prior to issuing into the pipe or flue and in contact with the outgoing products of combustion. The aforesaid air-chamber will be formed intermediate an interior sleeve placed within the exit-pipe and the walls of the said pipe, said sleeve being secured at its ends to said pipe and between said ends being of smaller diameter than the pipe. In its preferred form the said sleeve will be in the form of a double cone, as hereinafter described.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical longitudinal section through a section or length of stove-pipe and a portion of a stove, said length of pipe being equipped with and embodying my invention. Fig. 2 is a vertical transverse section of same on the dotted line 2 2 of Fig. 1, and Fig. 3 is a like section of same on the dotted line 3 3 of Fig. 1.

In the drawings, A designates a portion of a stove or furnace, B a length or section of exit flue or pipe connected with the outlet-nozzle C from the stove or furnace, and D a damper of any suitable form or construction within said pipe B.

The length of pipe B as to its exterior walls is of usual construction, with the exception that in the present instance said pipe is supplied with the inlet-apertures E, which may be furnished with a pivoted plate-valve F to enable the regulation of the quantity of air which shall be permitted to enter the apertures E.

Within the length of pipe B is secured the sleeve G, the latter being intermediate the damper D and nozzle C and being riveted or otherwise secured to the inner walls of the pipe B. The ends of the sleeve G contact with the walls of the pipe B; but intermediate these ends said sleeve G is of smaller diameter than the diameter of the pipe B, whereby intermediate said sleeve and said pipe is formed the elongated annular air-chamber H. The air is permitted to enter the air-chamber H through the apertures E, located adjacent to the outer end of said chamber, while the exit for the air from said chamber is through the apertures I, disposed at the inner end of said chamber. The products of combustion pass through said sleeve G and heat the surfaces thereof, with the result that the air within the chamber H becomes heated prior to its exit through the apertures I.

I do not limit the invention in every instance to any special form of the interior sleeve G, since the main consideration is, in the broader scope of the invention, that the said sleeve shall form the elongated annular air-chamber H, having the inlets E and exits I; but I recommend that the said sleeve G be given the outline illustrated in Fig. 1, in which said sleeve is presented as being composed of two truncated cone-sections, lettered J K, respectively, the cone formations at their smaller ends merging into one another and forming the throat L. It is of advantage also that the cone-section K be longer than the cone-section J, and I recommend that the section K be three times the length of the sec-

tion J, as illustrated in the drawings. The outgoing products of combustion pass through the sleeve G, and when said sleeve is formed of the cone-sections J K the said outgoing products are caused to pass through the contracted throat L and are thereafter permitted to expand laterally, with the result, as I have found, that a superior draft ensues.

In the employment of the invention the pipe-section B, containing the sleeve G, is applied upon the nozzle C of the stove or furnace in the ordinary manner, and the air is permitted to pass through the apertures E into the chamber H, wherein it will become heated and pass out through the exit-apertures I. It is intended that the air supplied through the apertures E shall be sufficient to maintain combustion without the aid of any draft below the grate-bars.

By means of my invention combustion is promoted, economy in fuel is effected, and a uniform condition of the fire is maintained.

The invention is not limited to any special length of sleeve G; but I recommend that the sleeve be about sixteen inches in length, so that the air-chamber H may be of abundant capacity and the air be afforded extended heating-surfaces with which it may contact during its transit from the inlet-openings E to the exit-openings I. The exit-openings I are by preference annularly disposed, as shown, whereby the air from the chamber H is substantially uniformly discharged around the entire circumference of the passage through which the products of combustion pass. The interior sleeve G is located without the stove, but in the pipe adjacent to the stove, and its operation is substantially automatic and constant, requiring no attention from the attendant, who will regulate the draft through the pipe by means of the damper D.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. As a new article of manufacture the exit-pipe section B for stoves and furnaces, said pipe-section B presenting the usual exterior surfaces and having secured within it the inner concealed sleeve G forming the air-chamber H which is closed at its outer end to the interior of said section B and contains the restricted outlets at its inner end leading into the interior of said section B, said section B also having the inlet-apertures E for air to the outer end of said chamber, and said sleeve G being in the form of two truncated cones merging into one another and forming the contracted throat at their meeting ends; substantially as set forth.

2. As a new article of manufacture the exit-pipe section B for stoves and furnaces, said pipe-section B presenting the usual exterior surfaces and having secured within it the inner concealed sleeve G forming the air-chamber H which is closed at its outer end to the interior of said section B and contains the restricted outlets at its inner end leading into the interior of said section B, said section B also having the inlet-apertures E for air to the outer end of said chamber, and being provided at a point beyond the outer end of said sleeve G with the damper D; substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 20th day of April, A. D. 1900.

FREDERICK W. WERNER.

Witnesses:

CHAS. C. GILL,

GUNDER GUNDERSON.