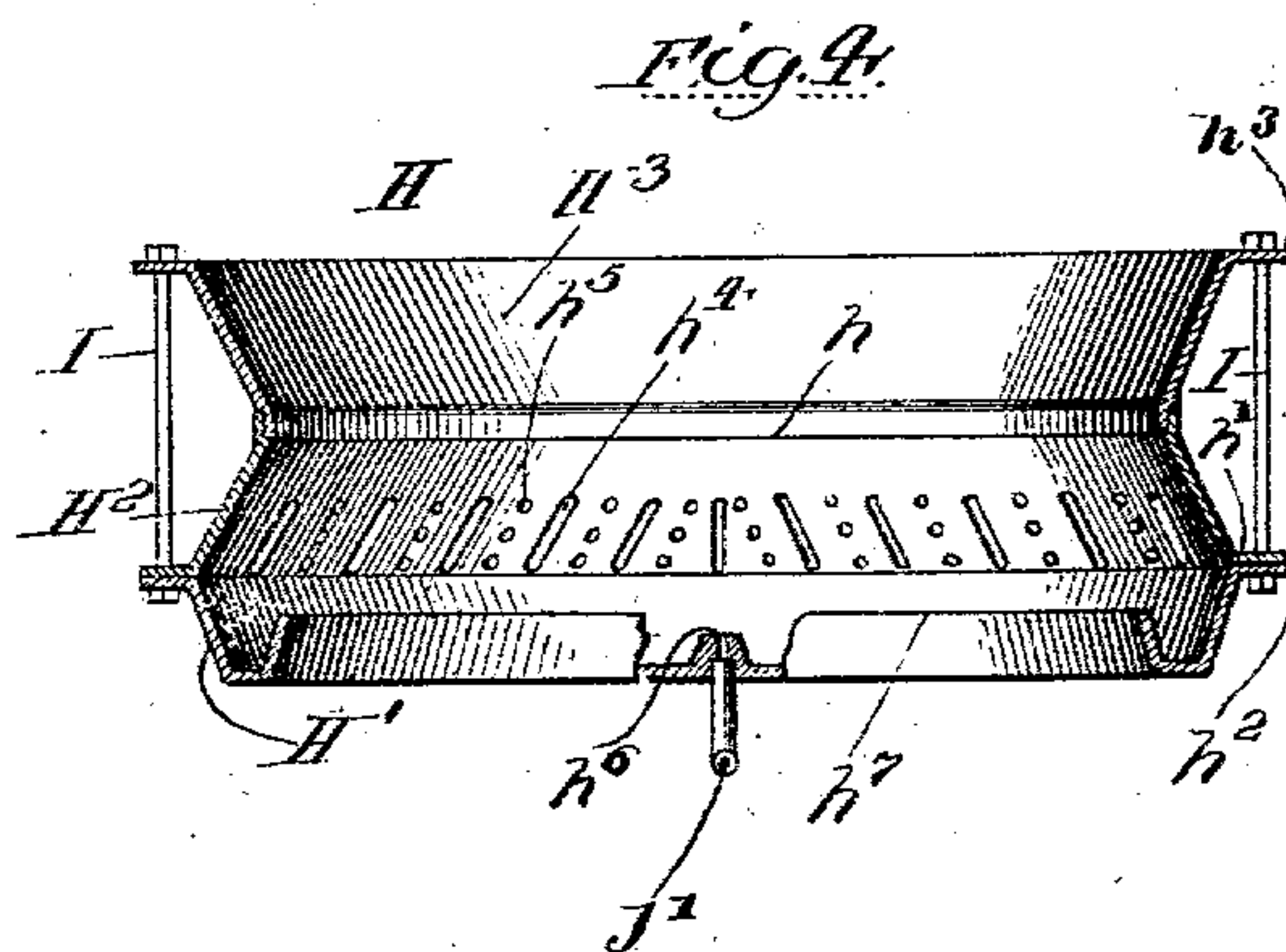
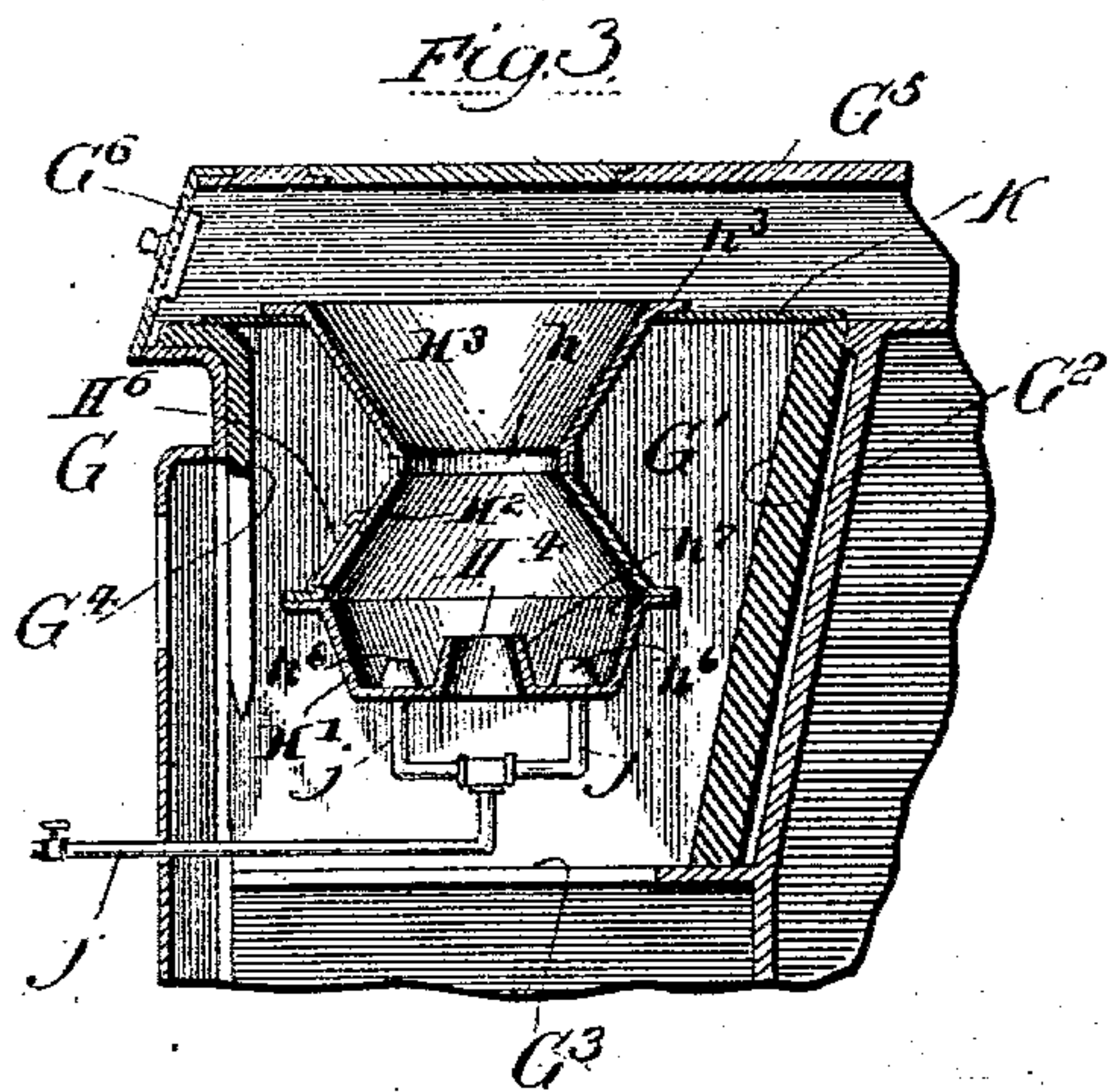
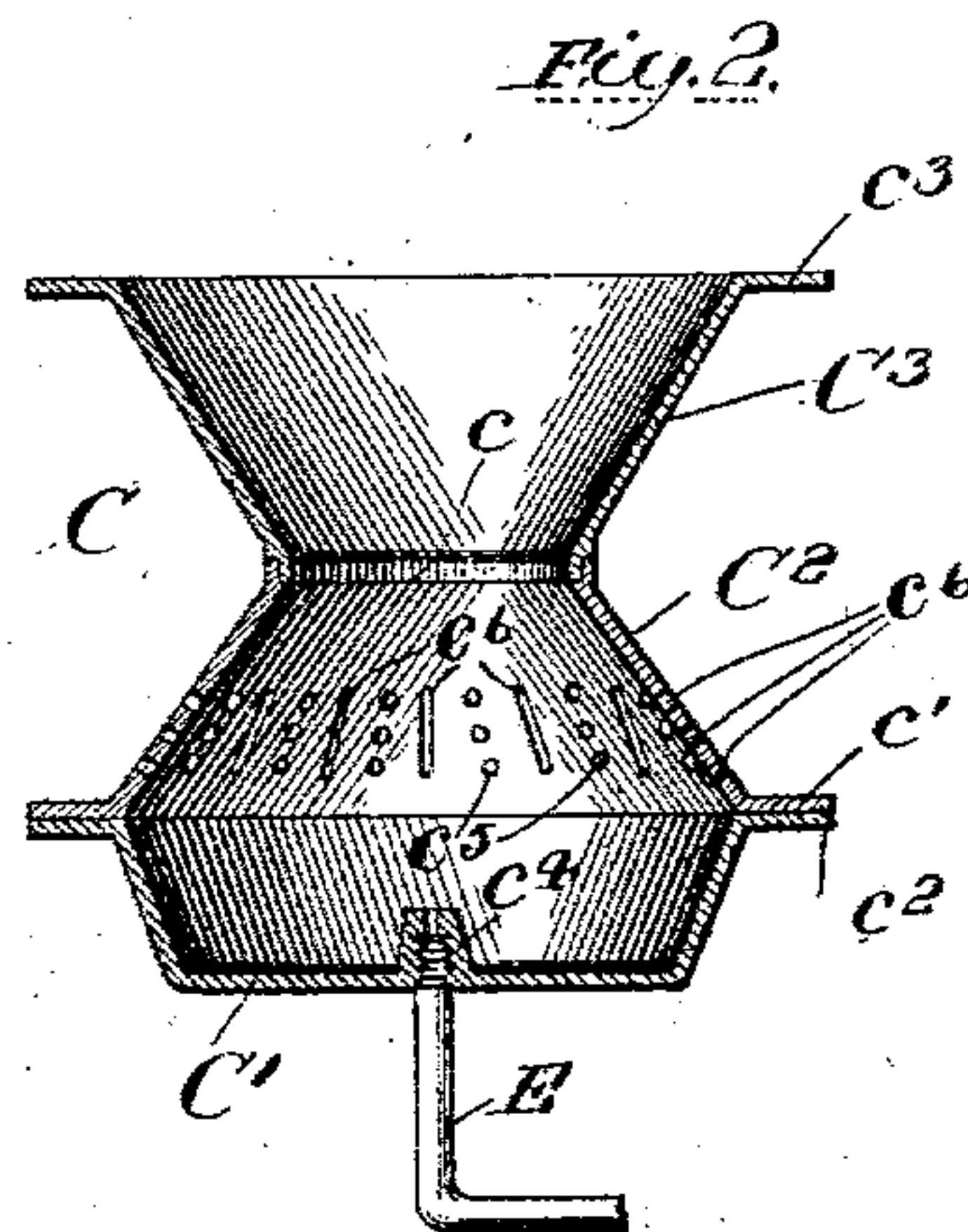
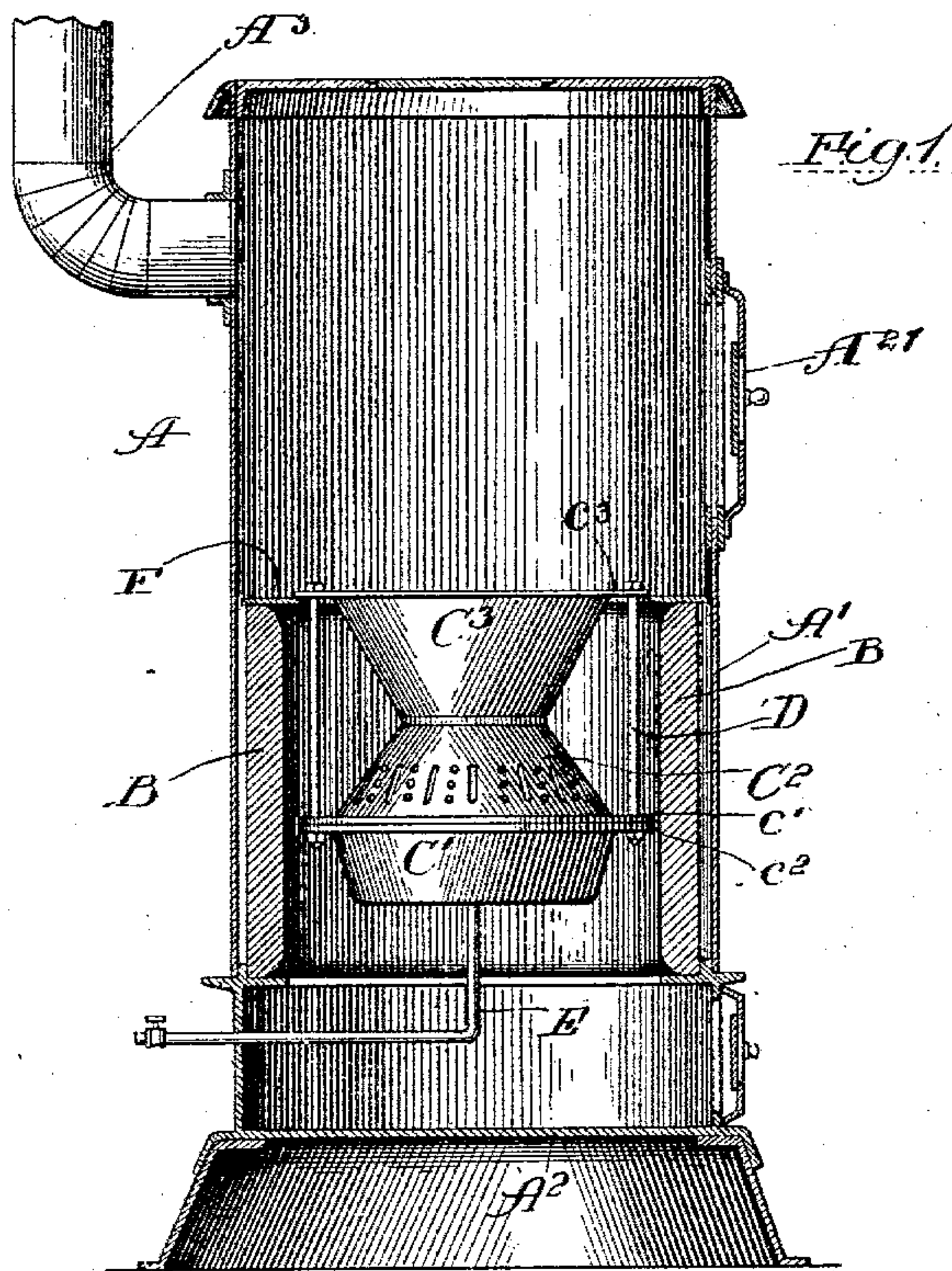


No. 720,889.

PATENTED FEB. 17, 1903.

A. H. CALKINS.
OIL BURNING DEVICE.
APPLICATION FILED APR. 7, 1902.

NO MODEL.



Witnesses:

Harold E. Barrett

William L. Hall

Inventor:

Almon H. Calkins

By Pool & Brown
his Attorneys.

UNITED STATES PATENT OFFICE.

ALMON H. CALKINS, OF SANTA MONICA, CALIFORNIA.

OIL-BURNING DEVICE.

SPECIFICATION forming part of Letters Patent No. 720,889, dated February 17, 1903.

Application filed April 7, 1902. Serial No. 101,637. (No model.)

To all whom it may concern:

Be it known that I, ALMON H. CALKINS, of Santa Monica, in the county of Los Angeles and State of California, have invented certain
5 new and useful Improvements in Oil-Burning Devices; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference
10 marked thereon, which form a part of this specification.

This invention relates to improvements in burners for oil-burning stoves, and refers more specifically to features of construction
15 which may be embodied as a part of the unitary construction of a heater or stove or which may be constructed as an attachment and applied to heating and cooking stoves which have been originally constructed and
20 designed for burning other kinds of fuel.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a central vertical section of a familiar form of heating-stove, showing one form of my improvements applied thereto. Fig. 2 is a central vertical
25 section of the features constituting my improvement removed from the stove. Fig. 3 illustrates the application of another form of my invention to a cooking-stove. Fig. 4 is a view in vertical longitudinal section of the form of heater shown in Fig. 3.

As shown in said drawings, A designates a
35 familiar type of heating-stove, known as a "cylinder" or "drum stove," and consists principally of a sheet-metal body A', containing the combustion-chamber, and a cast-metal base A², containing the ash-chamber. The
40 combustion-chamber of the stove is provided with a suitable lining B, made either of metal or fire-clay, and is also provided with a fuel-door A²¹ and a chimney or flue A³.

C designates as a whole my improved
45 burner. Said burner is made of cast metal and consists of a lower part or basin C', having upwardly and outwardly flaring side walls and into which the fuel-oil is delivered, an intermediate part C², having upwardly and in-
50 wardly inclined walls, and a top part C³, having upwardly and outwardly inclined walls, the whole having the general form of an hour-

glass or a double cone, the smaller ends of which are joined. The parts C', C², and C³ are circular in cross-section. The lower or
55 larger end of the intermediate portion C² of said burner-casing is made of the same diameter as the upper open end of the basin C'. For convenience in constructing the burner-casing said parts C' C² C³ are made separate
60 castings. The upper part C³ is provided at its lower or smaller end with an annular vertical flange c, which fits within an annular rabbet in the upper end of the intermediate part C², and the intermediate and bottom
65 parts are provided with radial overlapping flanges c' c², respectively, one lying flat upon the other. The several parts of the casing are united to form a unitary structure by means of tie-bolts D D, which extend through
70 the overlapping flanges c' c² and through a radial flange c³, formed on the top margin of the upper part or member C³ of the casing, as shown in Fig. 1.

The liquid fuel is delivered to the basin C'
75 through a pipe E, which enters the basin through the bottom wall thereof. The discharge end of the supply-pipe E communicates with a hollow nipple c⁴, which extends upwardly from the bottom wall of the basin
80 C'. The nipple c⁴ constitutes, in effect, the discharge end of the pipe E and is elevated above the bottom wall of the basin a sufficient distance to prevent the same being clogged by the refuse from the liquid fuel.
85 The wall of the intermediate part or member of the burner-casing is provided with a plurality of air-inlet openings, herein shown as consisting of alternate slits and apertures c⁵ c⁶, respectively, through which air is supplied
90 to the burner to promote combustion of the liquid fuel.

The casing as a whole is suspended in the stove A from a plate F, which latter is supported on the top of the lining B of the stove.
95 Said plate is provided with a central opening through which the burner-casing is inserted, and the flange c³ of the top part or member of the casing overlaps said plate F and constitutes the means for suspending the burner.
100 The supply-pipe E is herein shown as continued downwardly into the ash pit or chamber and from thence turned outwardly through the wall of the chamber, said wall of the

chamber being provided with a suitable opening through which the pipe extends. A flame may be introduced into the burner-casing through the top thereof for the purpose of initially igniting the liquid fuel.

The operation of the burner described is as follows: Liquid fuel is delivered to the basin C' and spreads in a thin sheet or film over the bottom of the same, and after the initial ignition has taken place said fuel burns throughout the area of the bottom wall of the basin, said liquid fuel spreading over the said bottom as it is delivered to the basin. Air is supplied through the openings c^5 c^6 and promotes the combustion which takes place throughout the parts C' C², and the oxygen of the air is mixed in suitable quantities with the gases of combustion while passing through the intermediate part or member of the burner-casing. The contraction of the upper part of the intermediate member C² of the casing has the effect to condense or make more compact the volume of the burning gases and to thereby thoroughly mix the oxygen of the atmosphere with the hydrocarbon gases of the liquid fuel and produce an efficient combustion. After the flame has passed through the contracted part of the casing it expands into the upper part or member C³ in long and heated flames, the flaring form of the casing acting to diffuse the flame throughout the upper part of the stove-body and to throw the heat thereof against the side walls of said stove-body.

The construction of the burner shown in Figs. 3 and 4 is essentially the same as that before described, being varied in form to adapt the same to the fire-box of a cook-stove. As shown in said figures, G designates the front upper portion of a cook-stove; G', the fire-box, provided with a refractory fireback G², a bottom grate G³, and a front grate G⁴. G⁵ designates the top plate of the stove, and G⁶ a coal-feed or broiling door opening into the space between the top plate and the fire-box. H designates as a whole the burner-casing, which is located in the fire-box G' of the stove. Said casing is made of oblong form and consists of a bottom member or basin H', having upwardly and outwardly flaring side walls, an intermediate member or part H², having upwardly and inwardly inclined side and end walls, and a top part or member H³, having upwardly-flaring walls. The top member is provided at its contracted lower end with a flange h , which fits into a rabbet at the upper or contracted end of the intermediate section, and the lower margin of the intermediate section is provided with a radial flange h' , which fits flat upon a similar radial flange h^2 on the upper margin of the basin H'. The parts are connected by means of tie-rods I, which extend through the overlapping flanges h' h^2 and a flange h^3 at the top of the upper part or member of the casing. The side walls of the intermediate part or member of the casing is provided with

arranged slits and apertures h^4 h^5 . The liquid fuel is furnished to the basin through a supply-pipe J, which extends through an opening in the front of the stove, and said supply-pipe is provided with branches j , which enter through the bottom wall of the basin, one at each side thereof, said pipes terminating in hollow nipples h^6 , similar to and for the same purpose as the nipple c^4 of the previously-described construction. Between the said nipples the bottom wall of the basin is provided with an air-inlet slot H⁴, and said bottom wall is provided with a short flange h^7 , which surrounds said slot and rises from the bottom wall a distance to prevent the liquid fuel escaping through the slot. The front wall of the intermediate part or member of the casing opposite to the front opening in the stove is provided with a sliding door H⁶, as shown in Fig. 3, through which a lighted taper is adapted to be inserted to initially ignite the liquid fuel. If desired, the form of burner shown in Fig. 2 may be provided at its bottom wall with an air-inlet opening corresponding to the slot H⁴ and similarly protected to prevent escape of the liquid fuel. The burner-casing H is supported upon a plate K, which rests upon the upper margins of the fireback and front grate, said plate being provided with an opening through which the burner-casing is inserted, and the casing is suspended from said plate in the same manner as the burner-casing C is suspended from its plate F. The plate K also rests at its ends upon the end linings of the fire-box. Obviously the operation of this form of burner is substantially like that of the form previously described and need not be repeated.

It will be observed that in both of the constructions shown the plates F and K, from which the burner-casings are suspended, are connected with the stove in such manner as to prevent the escape of air between the upper ends of the burner-casings and the stove-walls, so that all of the air admitted to the fire-box below the burner-casing must find its escape through the burner-casing, in which it is mixed with the hydrocarbon gaseous mixture of the liquid fuel to promote combustion thereof. While in both examples of the application of my invention the burners are shown in connection with a stove constructed to burn other than liquid fuel, it is obvious that my improvements may be equally well embodied in a stove originally designed for burning liquid fuel. So far as the operation of both forms of the burner is concerned, the stove frame or body constitutes a casing surrounding the burner and constructed to confine the air in such manner as to force the same through the burner, and in the event of constructing the stove originally for burning liquid fuel the casings of such stoves corresponding in function to the stove frames or bodies shown may be considerably varied in their forms and construction.

An important advantage of the particular construction herein shown—to wit, the forming of the casing in three separate parts—is that said parts may be very easily and cheaply constructed, while at the same time are capable of being readily assembled, and when assembled and united by the tie-rods described form a rigid and unitary structure which is as strong as though made from a single casting.

I claim as my invention—

1. An oil-burner for stoves comprising a casing having a bottom part which constitutes a basin adapted to receive the oil, an intermediate upwardly and inwardly tapered part and a top upwardly-flaring part, said bottom part being provided with an oil-inlet opening and having imperforate side walls, and the intermediate part being provided with a plurality of air-inlet openings.

2. An oil-burner for stoves comprising a casing having a bottom part which constitutes a basin adapted to receive the oil, an intermediate upwardly and inwardly tapered part and a top upwardly-flaring part which is open at its upper end, said basin being provided in its bottom wall with an oil-inlet opening which terminates in a nipple which extends above the bottom wall of the basin, and the intermediate part being provided with air-inlet openings whereby the combustion takes place wholly within the casing and the products of combustion pass upwardly through the open end of the upper section.

3. An oil-burner comprising a casing consisting of three separate parts, to wit, a bottom part constituting a basin adapted to receive the oil, and provided with an oil-inlet opening, an intermediate upwardly and inwardly tapered part provided with a plurality of air-inlet openings, and a top upwardly-flaring part which is open at its top for the escape of the products of combustion, said parts being in open communication with each other and united at their meeting edges to form air-tight joints, and means for securing the several parts of the casing together.

4. An oil-burner comprising a casing consisting of three parts, to wit, a bottom part constituting a basin adapted to receive the

oil and provided with an oil-inlet opening, an intermediate upwardly and inwardly tapered part fitting over the open end of said basin and provided with air-inlet openings, said intermediate part and basin being provided with overlapping radial flanges, and a top upwardly-flaring part open at its top and joined at its lower contracted end to the upper contracted end of the said intermediate part and provided at its top with a radial flange, and tie-rods extending through said last-mentioned flange and the overlapping flanges of the intermediate and bottom parts of the casing for securing said parts of the casing together.

5. An oil-burner comprising a casing the bottom part of which is formed to constitute a basin, and having an intermediate part which tapers upwardly and inwardly from the said basin, and a top part which flares upwardly from said intermediate part and open at its top, said intermediate part being provided with a plurality of air-inlet openings and the bottom wall of the basin being provided with an opening or slot to admit air, and with an oil-inlet opening and also with a flange which surrounds said air opening or slot to prevent the escape of oil through said opening or slot.

6. The combination with an oil-burner comprising a casing consisting of a bottom part formed to constitute a basin to receive the oil and provided with an oil-inlet opening, an intermediate part which tapers inwardly and upwardly therefrom and is provided with air-inlet openings, and a top part which flares upwardly from the intermediate part and open at its top, of a casing surrounding said burner-casing, a flue leading from said surrounding casing, and means preventing the passage of air upwardly between the upper end of the burner-casing and the surrounding casing.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 31st day of March, A. D. 1902.

ALMON H. CALKINS.

Witnesses:

B. M. MILLER,
C. L. BUNDY.