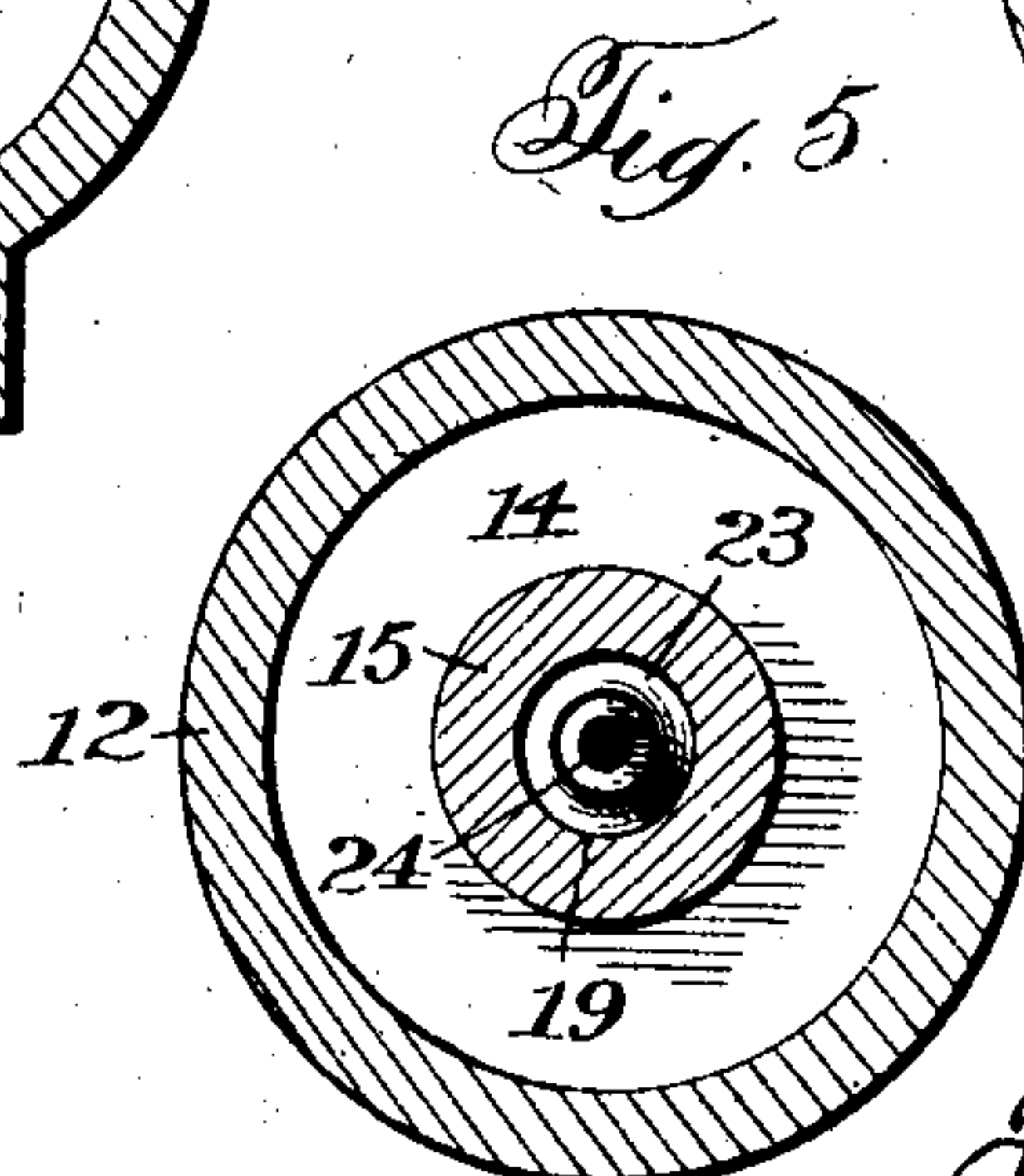
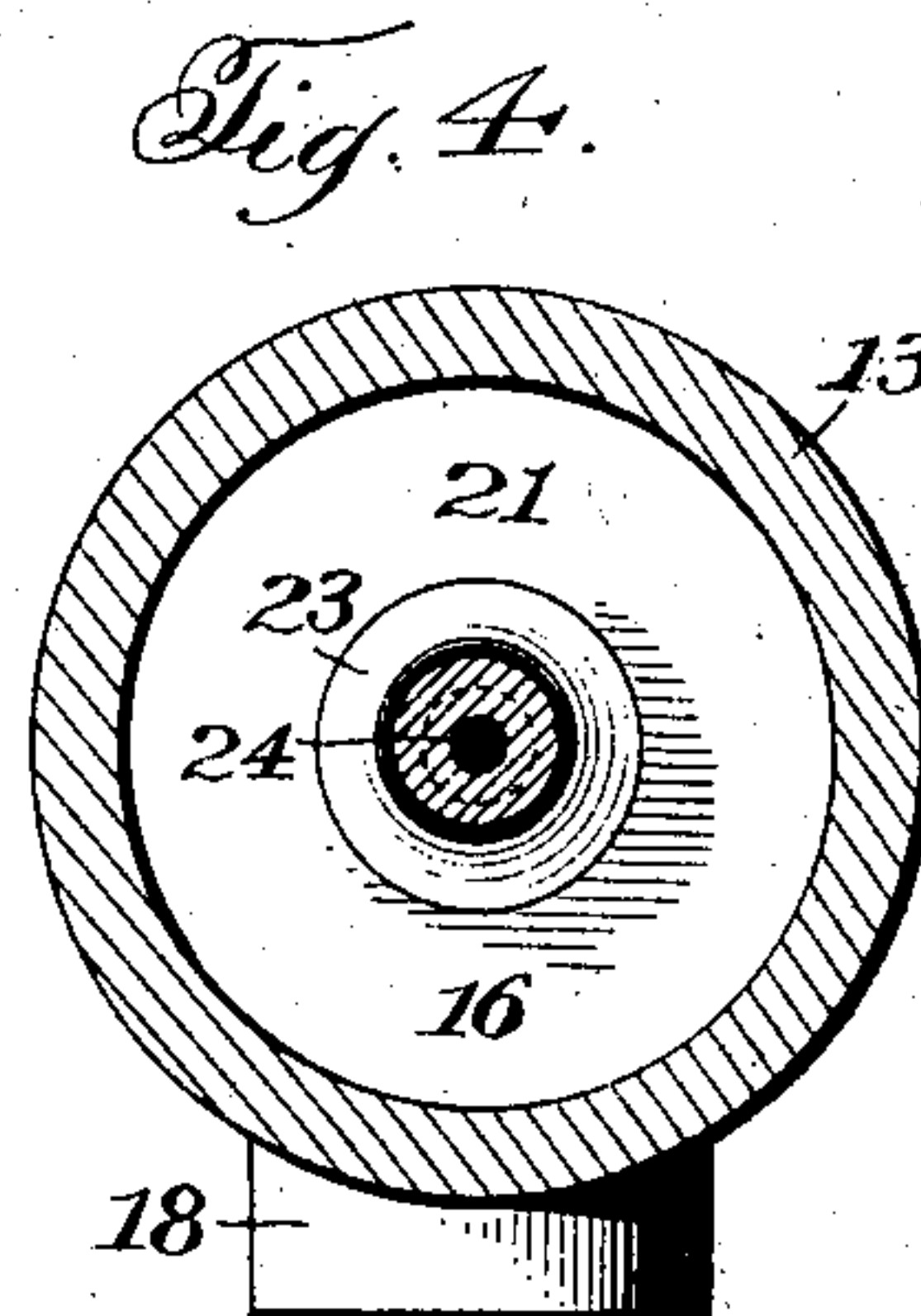
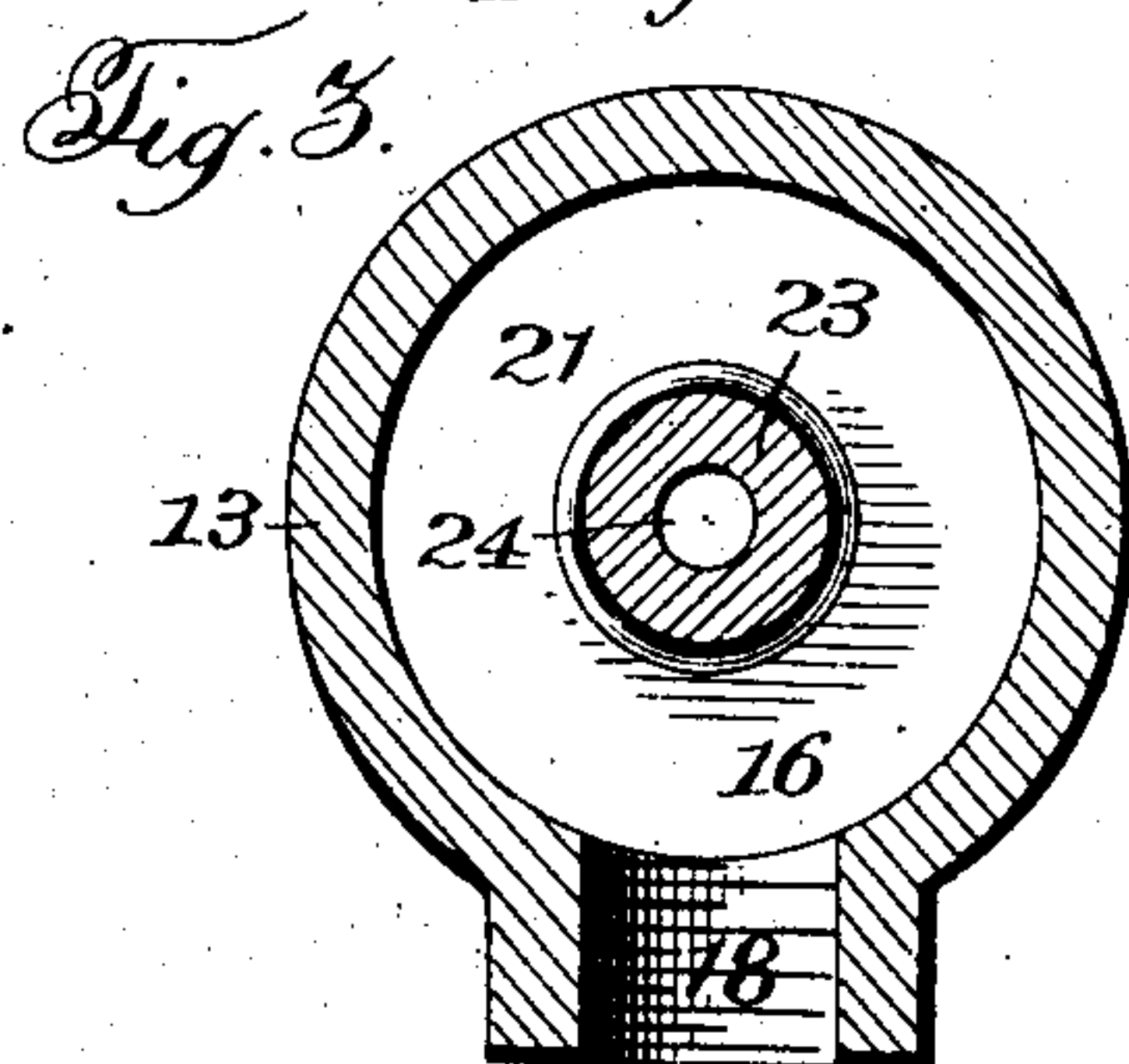
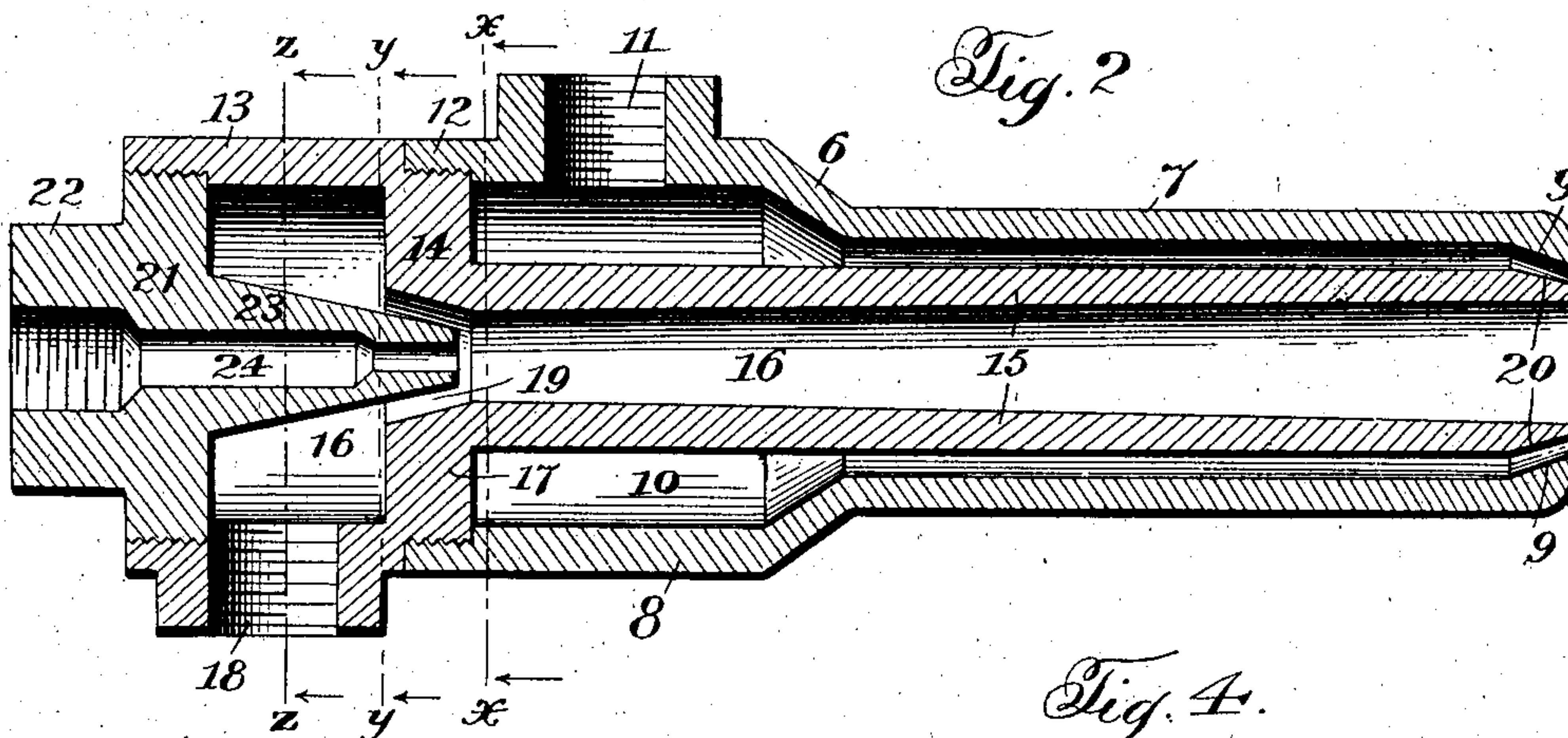
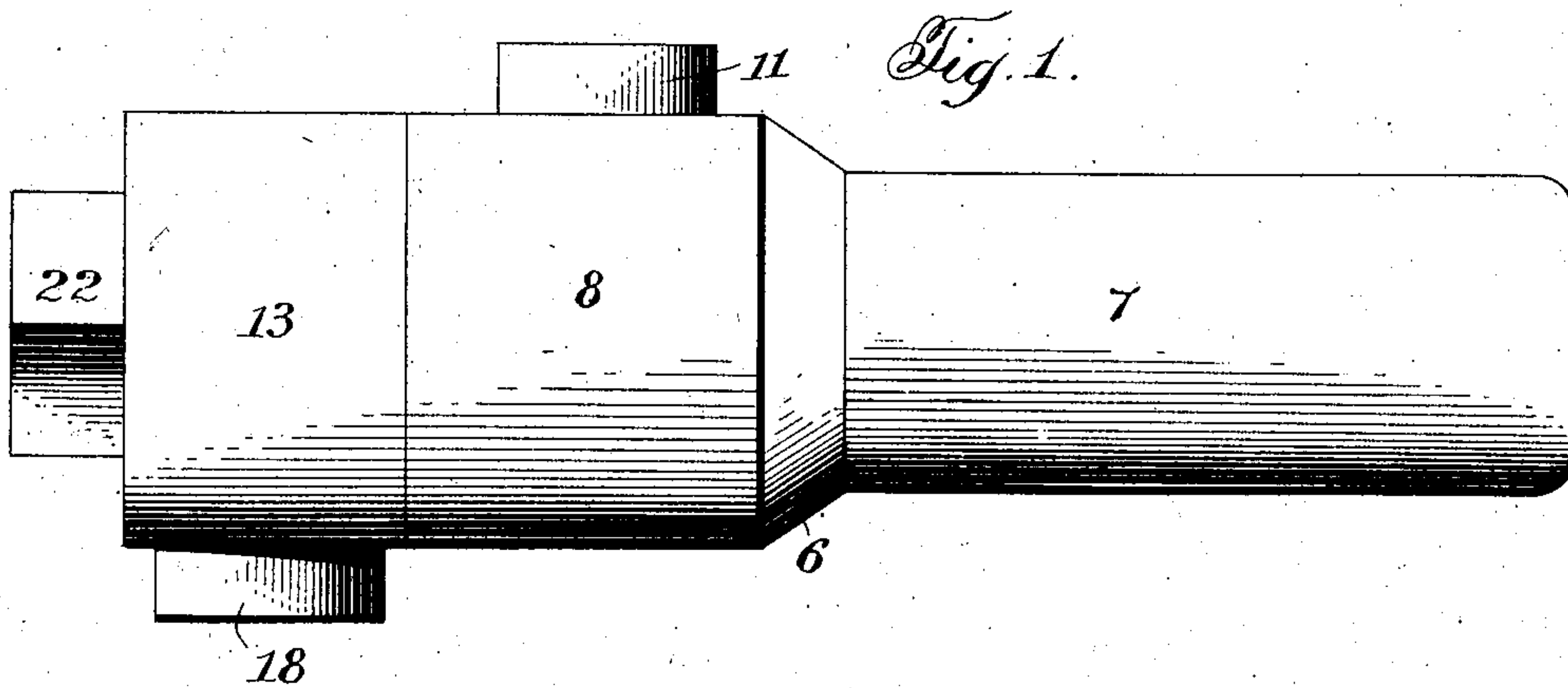


No. 834,203.

PATENTED OCT. 23, 1906.

J. F. HIGGINS.  
HYDROCARBON BURNER.  
APPLICATION FILED FEB. 17, 1906.



Witnesses:  
James Hutchinson  
Grace A. Marvin.

Inventor,  
James F. Higgins,  
By Royal E. Burham, Attorney.



# UNITED STATES PATENT OFFICE.

JAMES F. HIGGINS, OF NEW ORLEANS, LOUISIANA.

## HYDROCARBON-BURNER.

No. 834,203.

Specification of Letters Patent.

Patented Oct. 23, 1906.

Application filed February 17, 1906. Serial No. 301,674.

*To all whom it may concern:*

Be it known that I, JAMES F. HIGGINS, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to burners for the combustion of fuel for heating purposes, and especially to those whereby steam or other suitable fluid under pressure and oil or other combustible fuel are mixed, atomized, and discharged, combustion taking place at or near the point of discharge.

Improvements are made by this invention in the type of burner shown in my United States Letters Patent No. 792,265, issued June 13, 1905.

Simple and improved means are provided by the present invention whereby proper flow of either heavy or light fuel is produced and the fuel mixed and discharged with the fluid entering the burner under pressure, the elements being brought to the proper degree of heat during passage through the burner.

The invention further provides improvements in the details of structure and parts whereby an assembled device of few parts is produced which is simple, strong, efficient, and economical.

The details of construction and arrangement of parts contemplated by this invention are disclosed in the accompanying drawings, forming part hereof, wherein a preferable embodiment of the invention is shown for purposes of illustration and in which like reference characters refer to corresponding parts in the several views, whereof—

Figure 1 is an outer view of the burner. Fig. 2 is a central longitudinal sectional view. Fig. 3 is a cross-sectional view on the line *z z*, Fig. 2. Fig. 4 is a cross-sectional view on the line *y y*, Fig. 2; and Fig. 5 is a cross-sectional view on the line *x x*, Fig. 2.

Referring more particularly to the drawings, 6 designates an outer casing or shell. This casing comprises an elongated portion 7 and an enlarged portion 8, the two portions being preferably integrally formed. The elongated portion 7 at its free end constitutes a part of the discharge end of the burner, where it is interiorly contracted to form converging surface 9, whereby the material pass-

ing out of casing 6 is converged or contracted. Enlarged portion 8 forms a chamber 10, and through this portion of casing 6 is formed an entrance 11 to chamber 10, the entrance being interiorly screw-threaded for the reception of a supply-pipe. The open or free end 12 of casing 6 is interiorly screw-threaded. Into the screw-threaded end 12 is screwed a member comprising an outer casing 13, a substantially transverse portion 14, and an inner casing 15, these parts being integrally formed and producing a chamber 16 and a continuous passage therefrom to the discharge end of the burner.

Casing 13 is preferably coincident in thickness and transverse dimension with portion 8 of casing 6, to which it is jointed at its reduced screw-threaded part 17. It is interiorly screw-threaded at its other or outer end. Through casing 13 is formed an entrance 18 to chamber 16.

Portion 14 constitutes a substantially transverse partition between chambers 10 and 16 and is provided with an aperture or opening 19, said opening gradually decreasing in width from chamber 16 to where it merges with the interior of inner casing 15.

Inner casing 15 extends from portion 14 and opening 19 through chamber 10 and portion 7 of casing 6 to the discharge end of the burner. The outer surface of the portion of casing 15 passing through portion 7 is removed from and substantially parallel with the inner surface of portion 7 except at the discharge end, a continuous passage between the two casings thus being formed. At the discharge end casing 15 has a beveled exterior surface 20 complementary to surface 9 and with this latter surface forming a converging opening. The interior of casing 15 gradually increases in size from opening 19 to the discharge end.

Into the outer end of casing 13 is screwed a plug 21, formed with a squared outer end 22 to facilitate removal and having a thimble-shaped nipple 23 projecting through chamber 16 and into opening 19 and ending where casing 15 begins. The plug is formed with a centrally-disposed passage 24, extending from end to end of the plug, screw-threaded at its outer end for the reception of a supply-pipe and being of less width at its inner end than at its outer. The outer surface of nipple 23 is substantially parallel with the side of opening 19, and where it projects



into opening 19, is of less width than said opening, a passage from chamber 16 to casing 15 thus being left.

5 Steam or other suitable heated fluid is supplied to the burner through entrances 11 and 24, and oil or other fuel is supplied to chamber 16 through entrance 18. The steam or other fluid coming through entrance 11 enters chamber 10, surrounds casing 15, and  
10 passes out through portion 7. Steam or other fluid entering through passage 24 is discharged at the end of nipple 23 into casing 15, where it induces flow of fuel from chamber 16 through opening 19 and atomizes and  
15 mixes with the fuel, the mixture being carried by force of emission from the nipple through casing 15 and out of the burner. The interior of casing 15 gradually increasing in size from its receiving end to its discharge  
20 end, danger of back pressure of fuel is obviated. The fuel is first heated in chamber 16 by contact with nipple 23, through which steam or other heated fluid passes, and the temperature of the mixture of steam or  
25 other fluid and fuel is further raised to the proper degree during its passage through casing 15, which is surrounded and heated by the steam or other heated fluid entering passage 11. At the discharge end of the burner  
30 this latter supply of steam or other fluid is converged across and mixes with the discharge of mixture from casing 15 by the converging surfaces 19 and 20.

35 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A burner comprising an outer casing having an opening therein; a member attached to said outer casing and including a

short portion forming a chamber having an opening thereto, an apertured transverse portion constituting a partition between said chamber and the interior of said outer casing, and an inner casing extending from said apertured portion and its aperture through said outer casing, a space being left between said inner and outer casings; and a plug fitted into said short portion and comprising a nipple projecting through said chamber and into the aperture in said apertured portion, a passage being formed through said plug.

2. A burner comprising an elongated outer casing; an enlarged outer casing connected therewith, forming a chamber, and having an opening into said chamber; a member attached to said enlarged casing, said member comprising a short portion forming a chamber having an opening thereto and joining said enlarged casing with which it is coincident in thickness and width, an apertured transverse portion forming a partition between said chambers, and an inner casing extending from said apertured portion and its aperture through said enlarged and elongated outer casings, a space being left between said inner and outer casings; and a plug fitted into said short portion and comprising a nipple projecting through the chamber in said short portion and into the aperture in said apertured portion, a passage being formed through said plug.

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

JAMES F. HIGGINS.

Witnesses:

A. S. STEWART,  
JAMES A. STEWART.