

J. J. KELLY.  
BURNER.

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920,750.

Patented May 4, 1909.

Fig. 1.

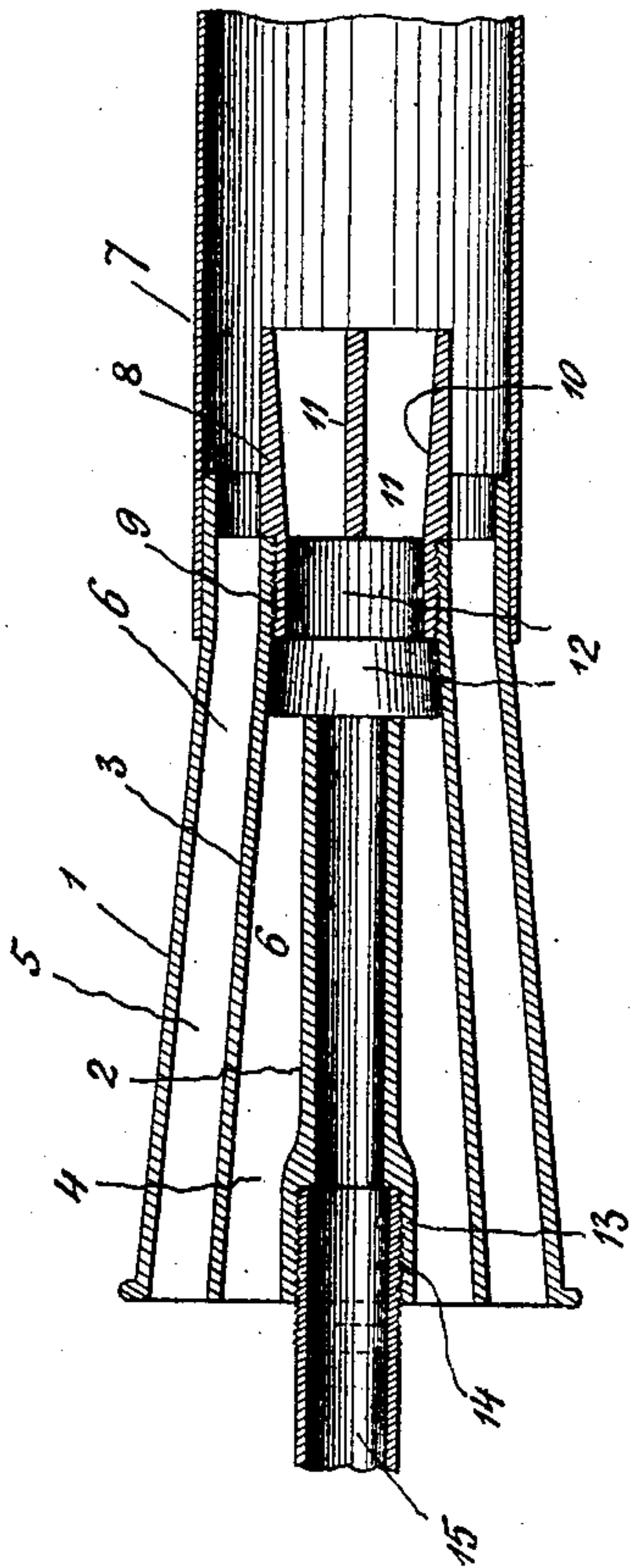


Fig. 3.

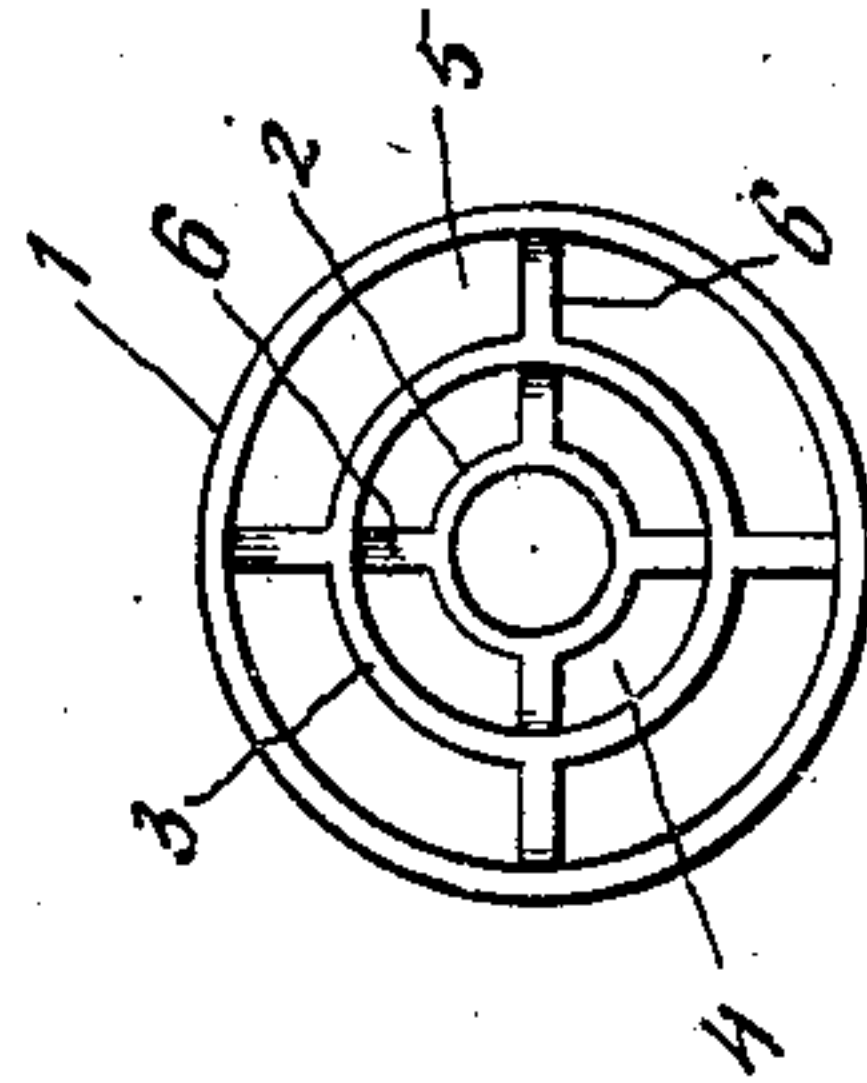


Fig. 2.

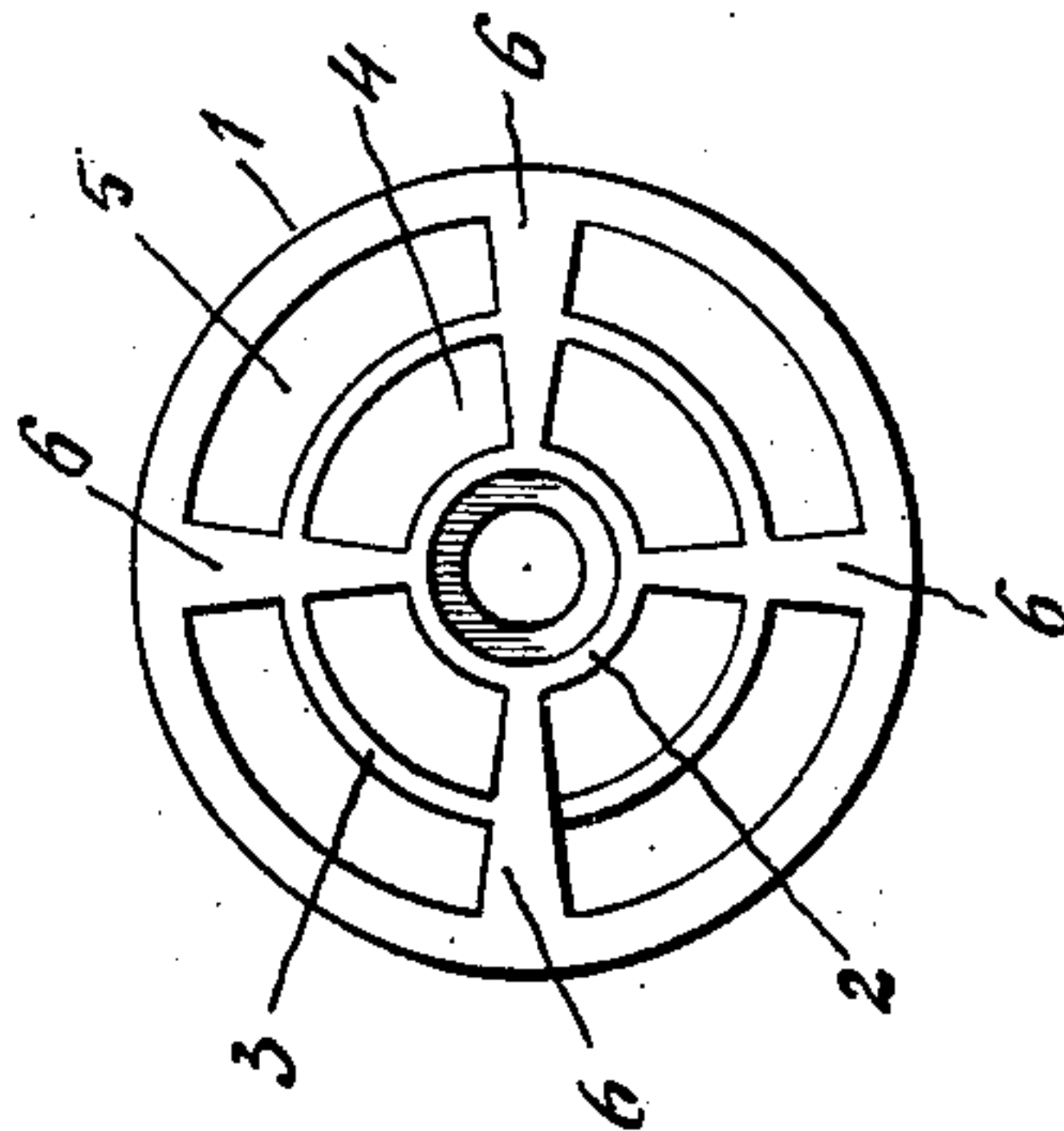
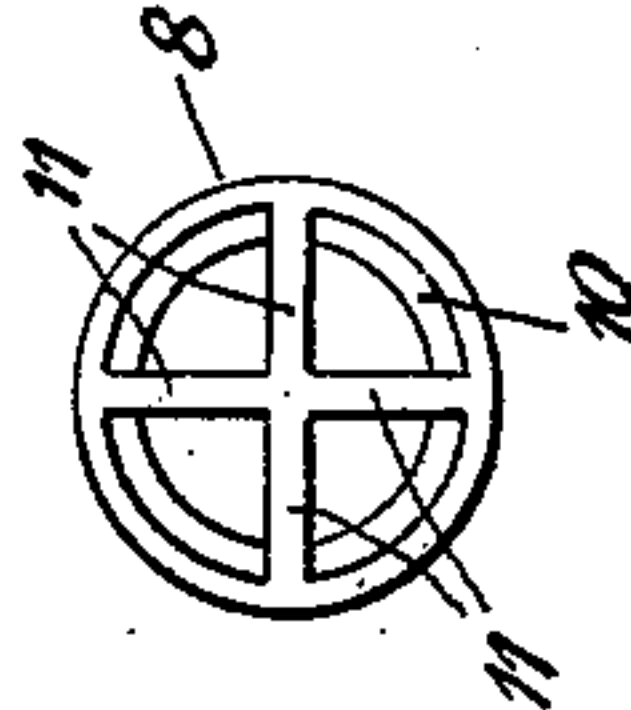


Fig. 4.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## BURNER.

No. 920,750.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed July 10, 1908. Serial No. 442,812.

*To all whom it may concern:*

Be it known that I, JAMES J. KELLY, a citizen of the United States of America, residing at Crafton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Burners, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to burners, and the primary object of the invention is to provide a novel burner, wherein positive and reliable means is employed for thoroughly mixing air and gas to produce a flame of considerable caloric intensity.

Another object of this invention is to provide a burner having an auxiliary air conduit which when considered in thermotics is of vital importance as an efficient means for producing a perfect combustion and a thorough consumption of the products of combustion.

A further object of the invention is to provide a simple and inexpensive burner which will be positive in its action for producing an incandescent flame.

With the above and other objects in view which will more readily appear as the invention is better understood, the same consists in the novel construction, combination and arrangement of parts to be presently described and then specifically pointed out in the appended claims.

In the drawings: Figure 1 is a longitudinal sectional view of a burner constructed in accordance with my invention, Fig. 2 is a view of the larger or inlet end of the burner with the gas supply pipe removed. Fig. 3 is a view in end elevation of the smaller or outlet end of the burner. Fig. 4 is a view in end elevation of the nozzle of the burner.

To put my invention into practice, I provide a tapering outer casing 1 in which is a centrally arranged longitudinally extending gas inlet pipe 2, and a tapering inner casing 3, said inner casing surrounding the pipe 2, and providing in connection with said pipe, a main air inlet conduit 4, and in connection with the casing 1, providing an auxiliary air conduit 5.

The outer casing 1, inner casing 3 and the gas inlet pipe 2 are spaced apart by radially disposed ribs 6, the ribs between the outer casing 1 and the inner casing 3 extending from the rear end of the outer casing 1 to the inner end of the casing 3, while the ribs 6 be-

tween the pipe 2 and the inner casing 3 terminate at their outer ends at the outer ends of said pipe 2 and casing 3, the inner ends of these ribs terminating at the inner end of the pipe 2.

The forward ends of the casings 1 and 3 are cylindrical for two purposes, first to accommodate a cylindrical flame shell 7 adapted to fit on the cylindrical end of the casing 1, and secondly, to receive a nozzle 8 threaded into the forward cylindrical end of the casing 3 as at 9, said nozzle corresponding in diameter to the diameter of the forward end of the casing 3. The nozzle 8 has its inner walls tapered or flared for approximately its entire length as at 10, and is sub-divided by a spider or intersecting partitions 11. The rear end of the nozzle 8 is contiguous to the forward end of the gas inlet pipe 2 and provides a mixing chamber 12 between the confronting ends of those ribs 6 that lie between the casing 3 and tube 2 and the partitions 11.

The rear end of the gas inlet pipe 2 is enlarged as at 13 and threaded into this enlarged end as at 14 is a gas supply pipe 15.

A burner constructed in accordance with the invention as described can be used with in furnaces of various types with either natural gas or artificial gas as the fuel, and the operation thereof briefly is as follows: Gas entering inlet pipe 2 through the supply pipe 15 is immediately enveloped by air admitted through the main conduit 4, the gas or air commingling in the chamber 12, and the mixture escapes through nozzle 8 into the flame shell 7 where it is ignited. For the purpose of insuring a perfect combustion, I provide the auxiliary air conduit 5, thus admitting an additional supply of air to the flame shell at the point where the admixed gas and air as it passes from the combustion chamber 12 is ignited in the flame shell.

I would have it understood that the elements herein illustrated and described as the preferred embodiments of my invention are susceptible to various changes without departing from the spirit of the invention.

Having now described my invention what I claim as new, is:—

1. A gas burner comprising a gas inlet pipe, a tapering inner casing surrounding said pipe and of greater length than the gas inlet pipe, ribs spacing said inner casing from the gas inlet pipe to provide a main



air conduit, a tapering outer casing surrounding said inner casing and of greater length than the same, ribs spacing said outer casing from the inner casing to provide an auxiliary air conduit, a nozzle mounted in the small end of said inner casing, a spider arranged in said nozzle, and a flame shell sleeved onto the inner end of said outer casing.

10 2. A burner of the type described comprising a gas inlet pipe, a gas supply pipe connected thereto, an inner tapering casing surrounding the gas inlet pipe and fixedly held in spaced relation thereto, said taper-  
15 ing inner casing having a cylindrical portion at its inner end projecting beyond the inner end of the gas inlet pipe, a nozzle connected to the said cylindrical inner end of the inner casing, an outer tapering casing  
20 surrounding the inner tapering casing and held in fixed spaced relation thereto, said outer casing having a cylindrical inner end projecting beyond the inner end of the inner casing, and a flame shell connected with  
25 the cylindrical inner end of said outer casing.

3. A burner of the type described comprising a gas inlet pipe, a gas supply pipe connected thereto, an inner tapering casing  
30 surrounding the gas inlet pipe and fixedly held in spaced relation thereto, the inner

end of said inner casing projecting beyond the inner end of said gas inlet pipe, a nozzle connected to the inner end of said inner casing in advance of the inner end of the gas inlet pipe, an outer tapering casing surrounding the inner casing and held in fixed spaced relation thereto, the inner end of said outer casing projecting beyond the inner end of the inner casing, and a flame shell connected to the inner end of said outer casing.

4. A burner of the type described comprising a gas inlet pipe, a gas supply pipe connected thereto, an inner tapering casing surrounding the gas inlet pipe and fixedly held in spaced relation thereto, the inner end of said inner casing projecting beyond the inner end of the gas inlet pipe, an outer tapering casing surrounding the inner casing and held in fixed spaced relation thereto, the inner end of said outer casing projecting beyond the inner end of the inner casing, and a nozzle secured in the inner end of the inner casing and projecting beyond the inner end of both casings.

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

JAMES J. KELLY.

Witnesses:

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K. H. BUTLER.