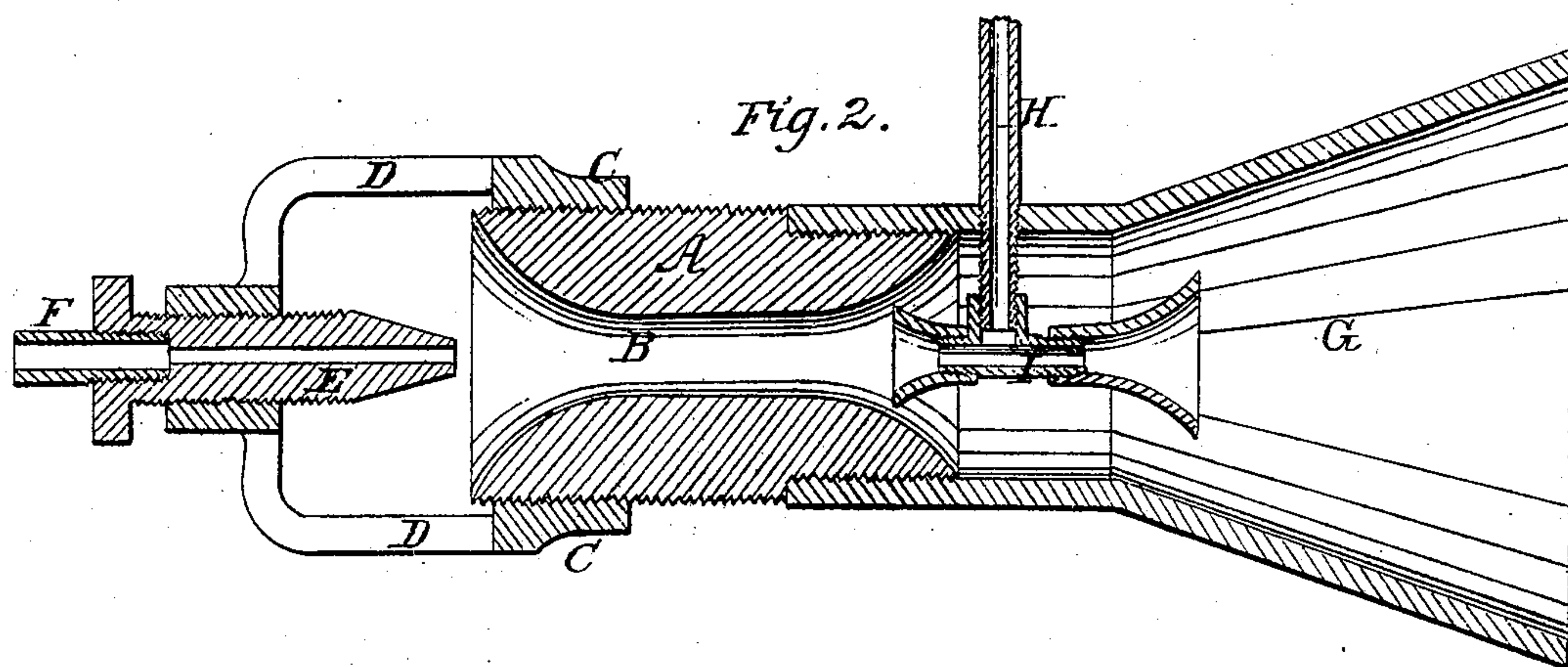
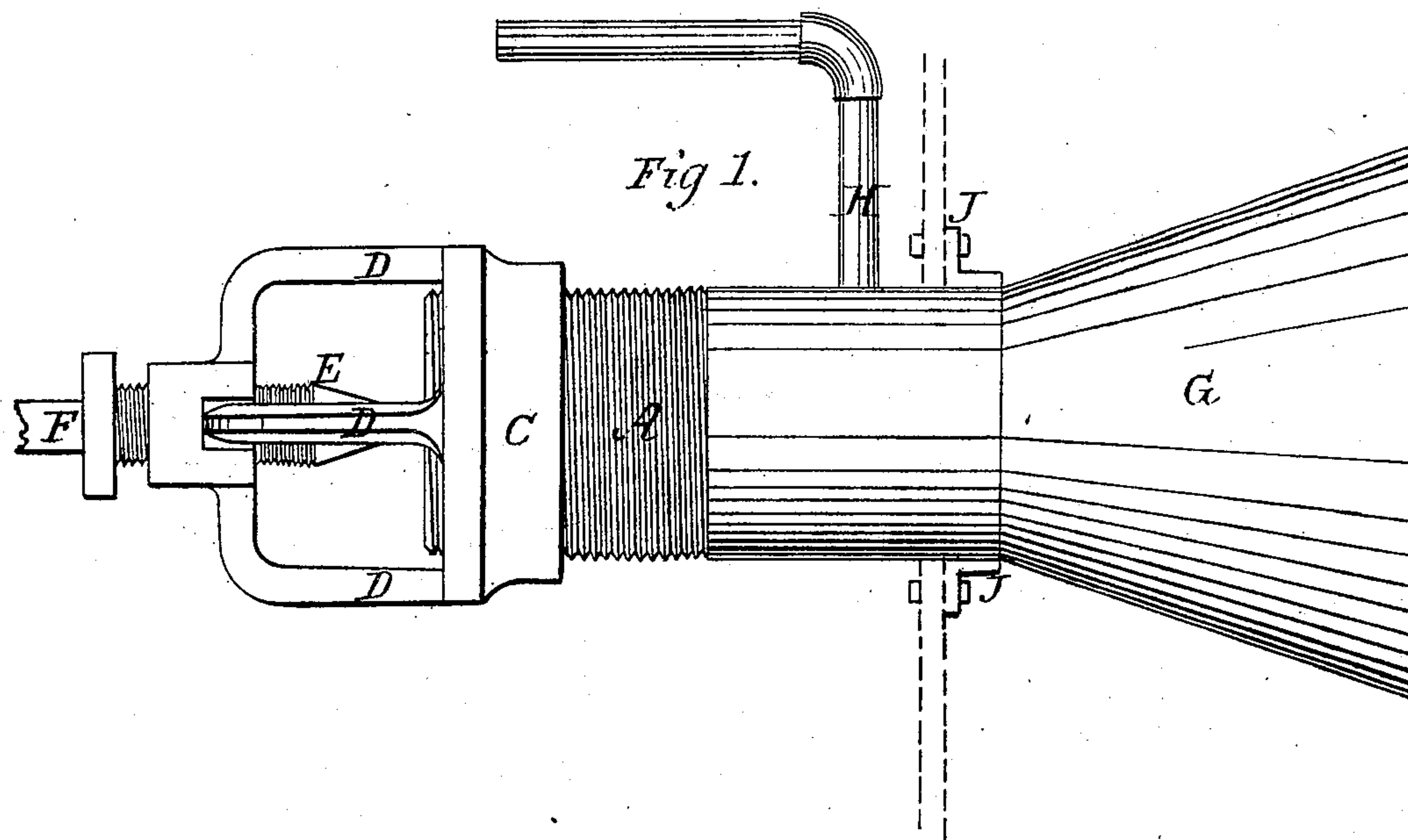


E. P. McCARTHY.  
Hydrocarbon Furnace.

No. 93,105.

Patented July 27, 1869.



Witnesses;  
Geo H. Strong  
C. W. Smith

Inventor;  
Edmond P. McCarthy



# United States Patent Office.

EDMOND P. McCARTHY, OF SAN FRANCISCO, CALIFORNIA.

*Letters Patent No. 93,105, dated July 27, 1869.*

## IMPROVEMENT IN HYDROCARBON-BURNERS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, EDMOND P. McCARTHY, of the city and county of San Francisco, State of California, have invented an Improved Device for the More Perfect Combustion of Petroleum; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvements without further invention or experiment.

My invention relates to that class of burners used for the combustion of petroleum and other hydrocarbons; and

It consists in providing an apparatus by which ordinary wet steam from the boiler is passed from a jet-tube through a peculiarly-shaped pipe, so that it forms a partial vacuum, by which means a body of air is carried in and mixed with the steam.

The oil is discharged into this pipe at a point where it will fall into the blast of mixed steam and air in such a manner that it is instantly converted into a fine spray, in which condition it enters the furnace, where it is burned with the aid of the steam and air, no retort being necessary.

To more fully explain my invention, reference is had to the accompanying drawings, forming a part of this specification, of which—

Figure 1 is a side view of my apparatus.

Figure 2 is a side sectional view of the same.

Similar letters of reference in each of the figures indicate like parts.

A is a tube or pipe, with a longitudinal opening, B, through it, this opening being enlarged so as to be bell-shaped at each end.

A screw-thread is cut on the outside of the tube A at each end.

On one end is a nut, C, having four converging arms, D D, which meet in a central line a short distance from the plane of the nut C.

A jet-tube, E, is screwed into the boss at the junction of the arms, and steam from the boiler passes through it from the pipe F.

Both the jet-tube and the nut C are adjustable, so that the jet may be introduced or withdrawn from the opening B to regulate its effects.

An expanded nozzle, G, screws on the opposite end of the tube A, and serves as a discharge or burner for the combined vapors.

The oil is brought in through the pipe H, and drops into the tube I.

This tube is made bell-shaped at each end, similar to the tube A.

A flange, J, serves to bolt the whole to the furnace-front or cupola.

The operation of my burner is as follows:

Steam is first raised by an ordinary fire to a pressure of five pounds, and then allowed to pass through the jet E into the passage B, thus forming a partial vacuum, which causes a current of air to rush in around the jet E and mingle with the steam. As soon as the pressure of five pounds is gained, the doors of the furnace and ash-pit are closed. The oil being turned on, is caught by the mingled column of steam and air in the tube I before described, and which, by its shape, causes the oil to be thoroughly divided and formed into spray or vapor, which, mixed with the steam and air, is thrown out through the nozzle G into the furnace in a condition for combustion.

By this arrangement, retorts are entirely done away with, the most perfect mingling of the steam, air, and oil-vapor is accomplished, and the whole is immediately thrown out of the nozzle and burned in the fire-box or furnace.

All the difficulty is thus avoided which has been heretofore experienced from retorts acting as a still in which a hard deposit is formed, and the retort soon destroyed. A much more perfect combustion is effected, while the device is very cheap and simple, easily applicable to any furnace.

For producing an intense heat in cupolas, puddling-furnaces, and for the purpose of making steam, it is the most effective yet discovered.

I do not, however, claim the commingling or mixing of steam, air, and a hydrocarbon for the purpose of combustion, as that has long been practised; but having thus described my invention,

What I do claim as new, and desire to secure by Letters Patent, is—

1. The arrangement of the adjustable steam-pipe E, in combination with the bell-mouthed pipe A, whereby said pipe E forms a plug to regulate the quantity of air admitted to mingle with the steam, substantially as described.

2. The combination and arrangement of the double bell-mouthed pipes A and I, for contracting and allowing to expand again the mingled currents of air and steam, whereby the air, steam, and oil are more thoroughly mixed before entering the furnace, substantially as herein set forth.

In witness whereof, I have hereunto set my hand and seal.

Witnesses: EDMOND P. McCARTHY. [L. s.]

GEO. H. STRONG,

C. W. M. SMITH.