

No. 705,530.

Patented July 22, 1902.

J. F. HIGGINS.  
HYDROCARBON BURNER.

(Application filed July 30, 1901.)

(No Model.)

Fig. 1.

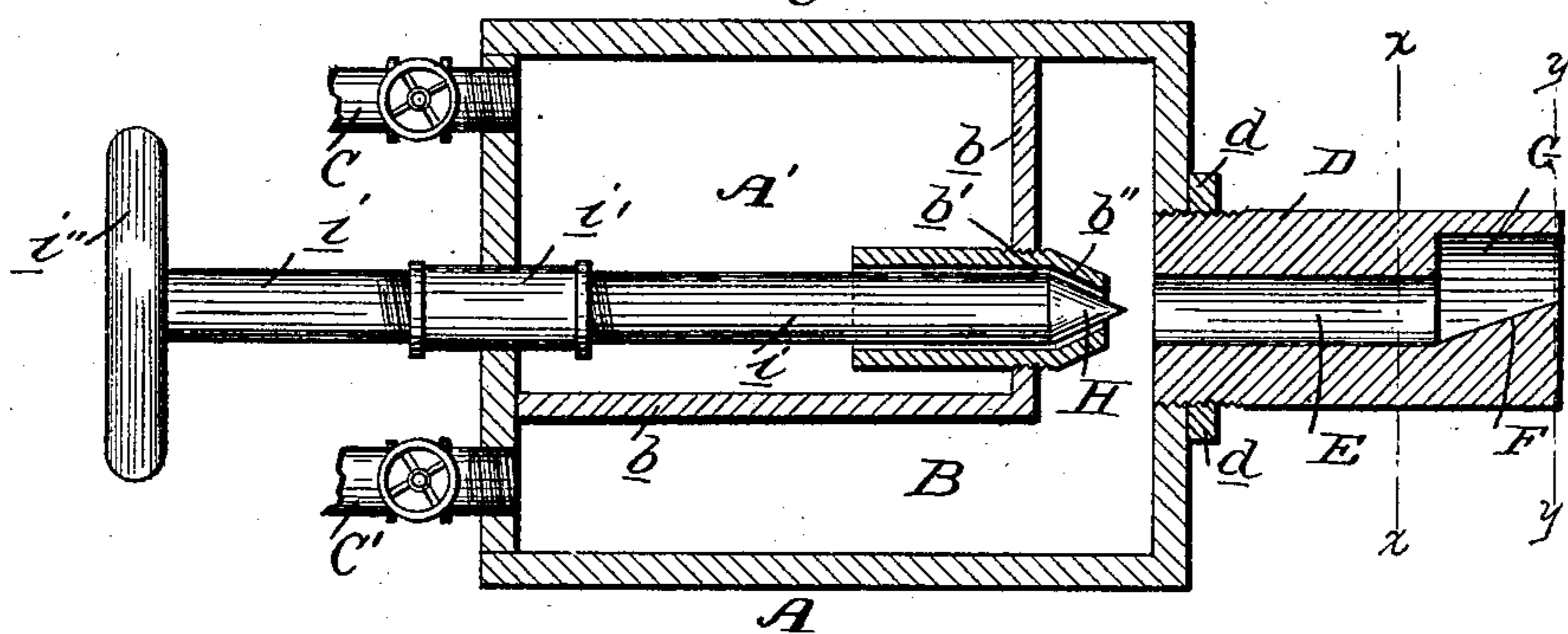


Fig. 3.

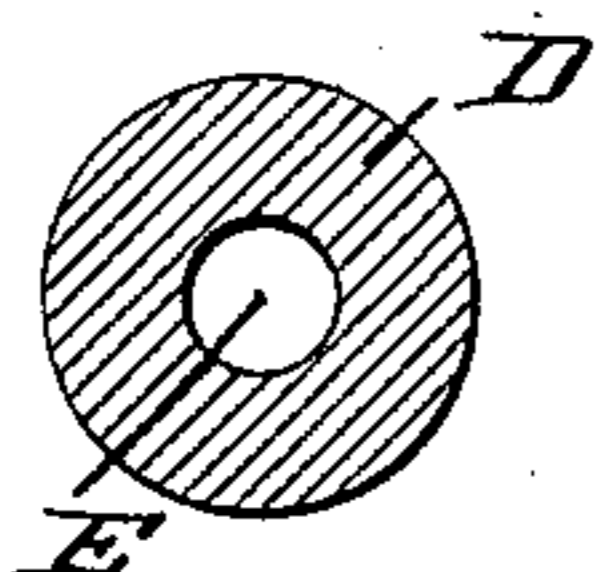


Fig. 4.

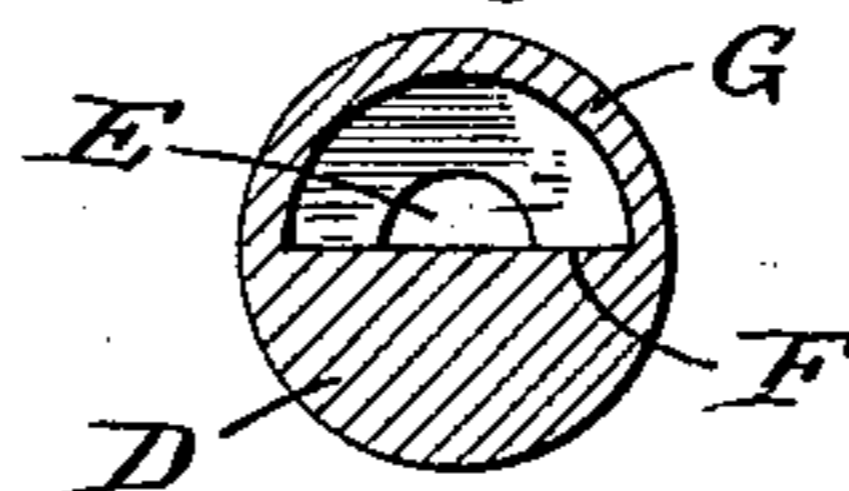
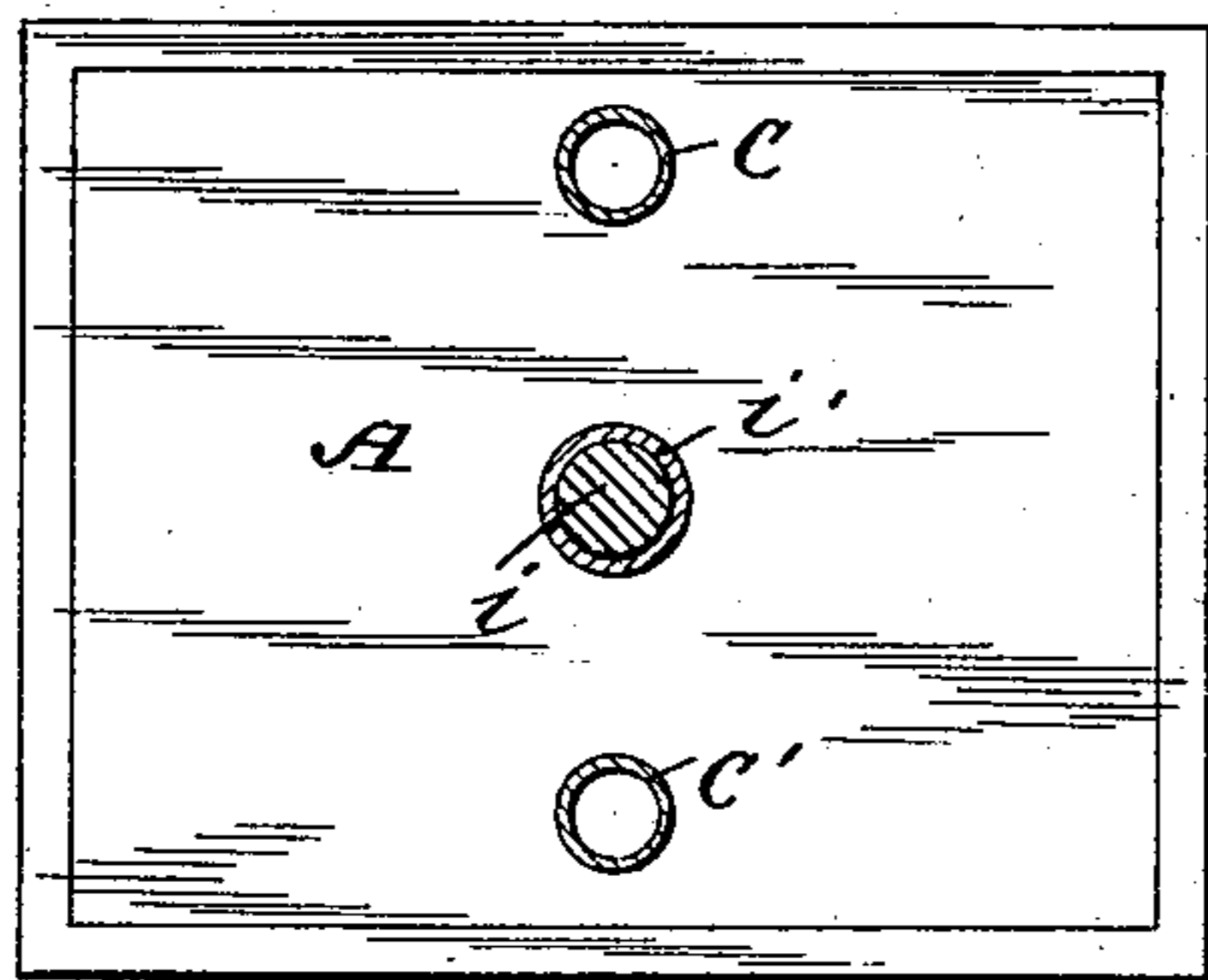


Fig. 2.



WITNESSES:

J. Donaldson.  
Cabrini T. Milant.

INVENTOR:

James F. Higgins.

BY

Royal E. Burnham,  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

JAMES FRANKLIN HIGGINS, OF CORSICANA, TEXAS.

## HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 705,530, dated July 22, 1902.

Application filed July 30, 1901. Serial No. 70,306. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES FRANKLIN HIGGINS, a citizen of the United States, residing at Corsicana, in the county of Navarro and State of Texas, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in hydrocarbon-burners, and has for its primary object the provision of a burner wherein the heating of the oil and its commingling with steam will be greatly facilitated.

The invention also embraces the idea of providing a nozzle for the burner which will have an improved atomizing discharge.

Novel details in the arrangement and construction of the several parts of the burner will be apparent from the detailed description hereinafter when read in connection with the accompanying drawings, forming part hereof, and the appended claims.

In the said drawings a preferable embodiment of the invention is delineated for the purposes of illustration, and when referring to the same like reference characters will refer to corresponding parts in the several views, whereof—

Figure 1 is a longitudinal sectional view of the complete burner. Fig. 2 is a rear elevation of the same. Fig. 3 is a sectional view of the nozzle, taken on the line  $xx$  of Fig. 1; and Fig. 4 is a section on the line  $yy$  of Fig. 1.

Referring more specifically to the drawings, A designates a metallic casing of any desired shape, that employed in the present instance being preferably rectangular. This casing has its interior divided by a partition  $b$  into the chambers A' and B. The former chamber is located adjacent the top and rear end walls of the casing, while the latter extends along the casing beneath the chamber A' and around the end thereof adjacent the forward wall of the casing. Near the upper portion of the chamber A', passing through the rear wall of the casing, is a suitably-valved inlet-pipe C for oil, the same leading to any desirable source of supply. (Not shown.) A corresponding pipe C' communicates with the

rear end of the chamber B, through which steam is supplied to said chamber. At the center of the forward wall of the casing a nozzle D is screw-threaded thereinto, a lock-nut  $d$  retaining the same in adjusted position. This nozzle for the greater portion of its length has a longitudinally-disposed circular passage E, constituting a mixing-chamber, while at the discharge end thereof the same is formed with a widened upwardly-extending inclined portion F, located in the path of the discharge through the passage E. Directly above the inclined portion F is a hood G, which, as well as the other peculiar features of the nozzle, is for purposes to be hereinafter pointed out. In alinement with the passage F in the nozzle the vertical portion of the partition  $b$  is provided with a valved opening  $b'$ , the valve being of the needle type, as indicated at H. The valve-seat  $b''$  projects outwardly from the partition into the chamber B. The valve may be operated in any manner found most expedient, perhaps the simplest method being to provide the same with an elongated screw-threaded stem  $i$ , adjustable through a bearing  $i'$  in the rear wall of the casing through the medium of a hand-wheel  $i''$ . It will be noticed that the valved opening just described is situated at the lower portion of the chamber A' at a point diagonally opposite the inlet thereto.

From the above description the operation may be stated as follows: The oil being fed into the chamber A', which may be termed a "heating-chamber," is initially heated by the steam passing therebeneath through the chamber B, and from the chamber A' the heated oil escapes through the valved opening in desirable quantities, according to the regulation of the valve, and is ejected, together with a quantity of the steam, into the mixing-chamber of the nozzle, from whence the mixed fuel comes in contact with the inclined portion of the nozzle, which in turn reduces to a spray or atomizes the same previous to its ignition. The purpose of the hood G is to catch any oil deflected upward thereagainst and itself atomize the same or cause it to fall back onto the inclined portion for that purpose. From the location of the outlet of the chamber A' relative to its inlet it will be apparent that the oil escaping from

said chamber will be that contained at the hottest portion thereof and that as the chamber is charged with oil the same will become gradually heated as it descends.

5 Although one special construction has been disclosed, it is to be understood that it is not the intention to be necessarily limited to the details thereof, as many changes or alterations may obviously be made without in the  
10 least departing from the spirit of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

15 1. In a burner of the character described, the combination with a casing, of a nozzle at one end of the casing, an angular partition in said casing constituting with the walls thereof an oil-chamber, an inlet through the  
20 end wall of the casing to said oil-chamber, a valved outlet from the oil-chamber at the lower end portion of the partition and in substantial alinement with the nozzle, a steam-chamber between the bottom of the casing  
25 and the oil-chamber and extending around the end of said oil-chamber, and an inlet through the end wall of the casing to said steam-chamber.

2. An atomizing-nozzle of substantially the

character described, formed at its inner end 30 with a passage constituting a mixing-chamber and at its discharge end with an inclined portion projecting into the path of the discharge from said passage.

3. An atomizing-nozzle of substantially the 35 character described, formed at its inner end with a straight longitudinally-disposed passage constituting a mixing-chamber and at its discharge end with an upwardly-inclined portion projecting into the path of the dis- 40 charge from said passage.

4. An atomizing-nozzle of substantially the character described, provided at its inner end with a longitudinally-disposed passage E and at its discharge end with an upwardly-in- 45 clined portion projecting into the path of the discharge from said passage, and a hood G arranged above said inclined portion and out of the path of said discharge from said passage, said hood being adapted to atomize the 50 oil deflected thereagainst from said inclined portion.

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

JAMES FRANKLIN HIGGINS.

Witnesses:

A. B. SAWYERS,  
W. B. THOMAS.