

No. 635,376.

Patented Oct. 24, 1899.

G. S. EMERICK.
GROUND AND FLUID FUEL BURNER.

(Application filed July 6, 1899.)

(No Model.)

Fig. 3.

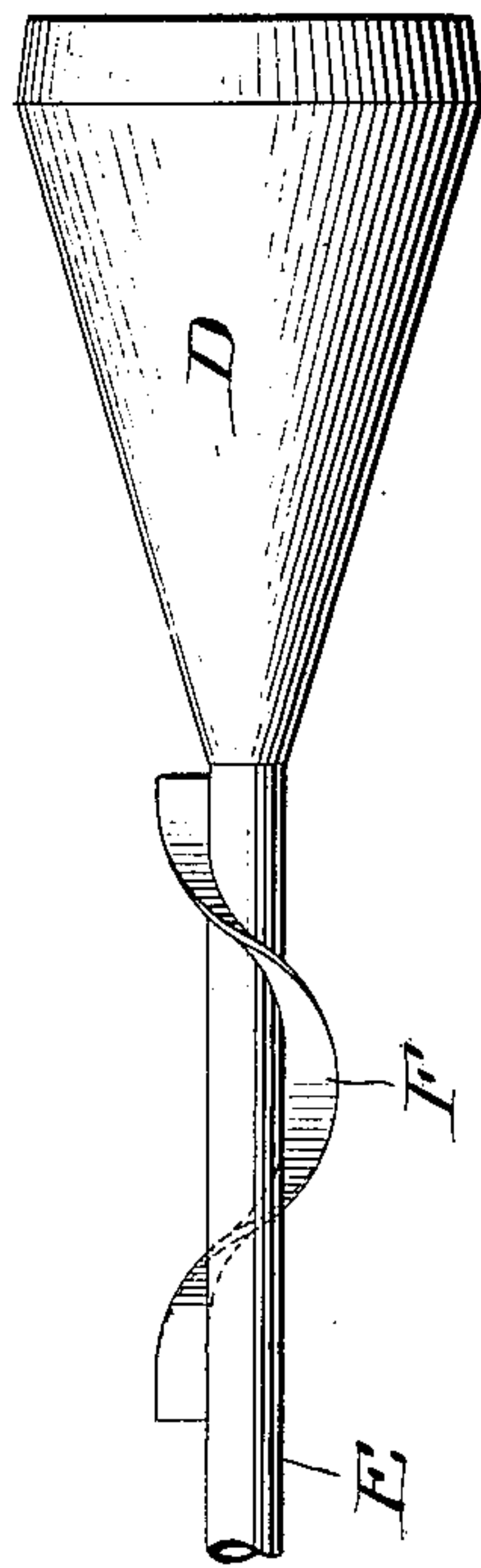


Fig. 2.

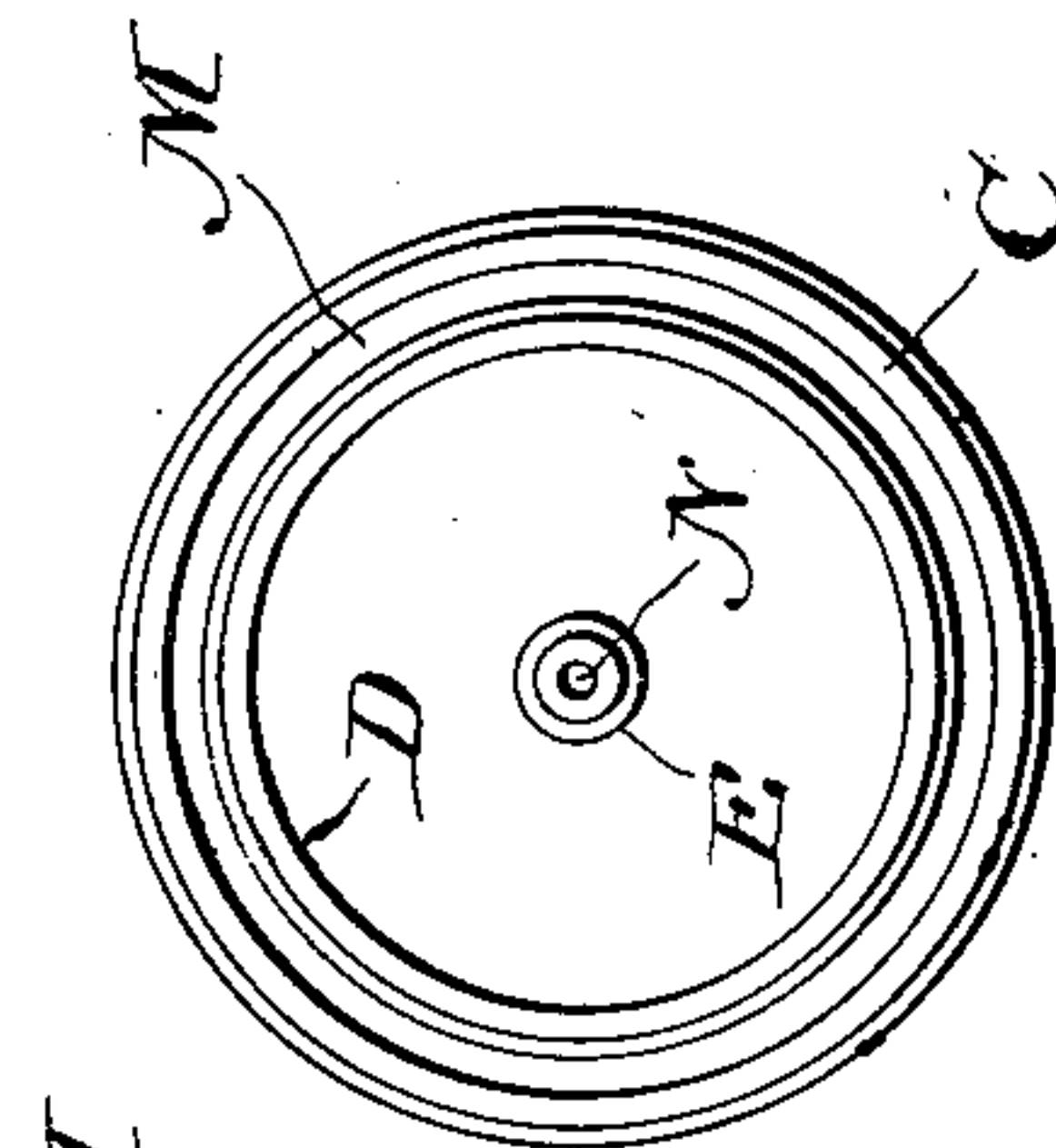
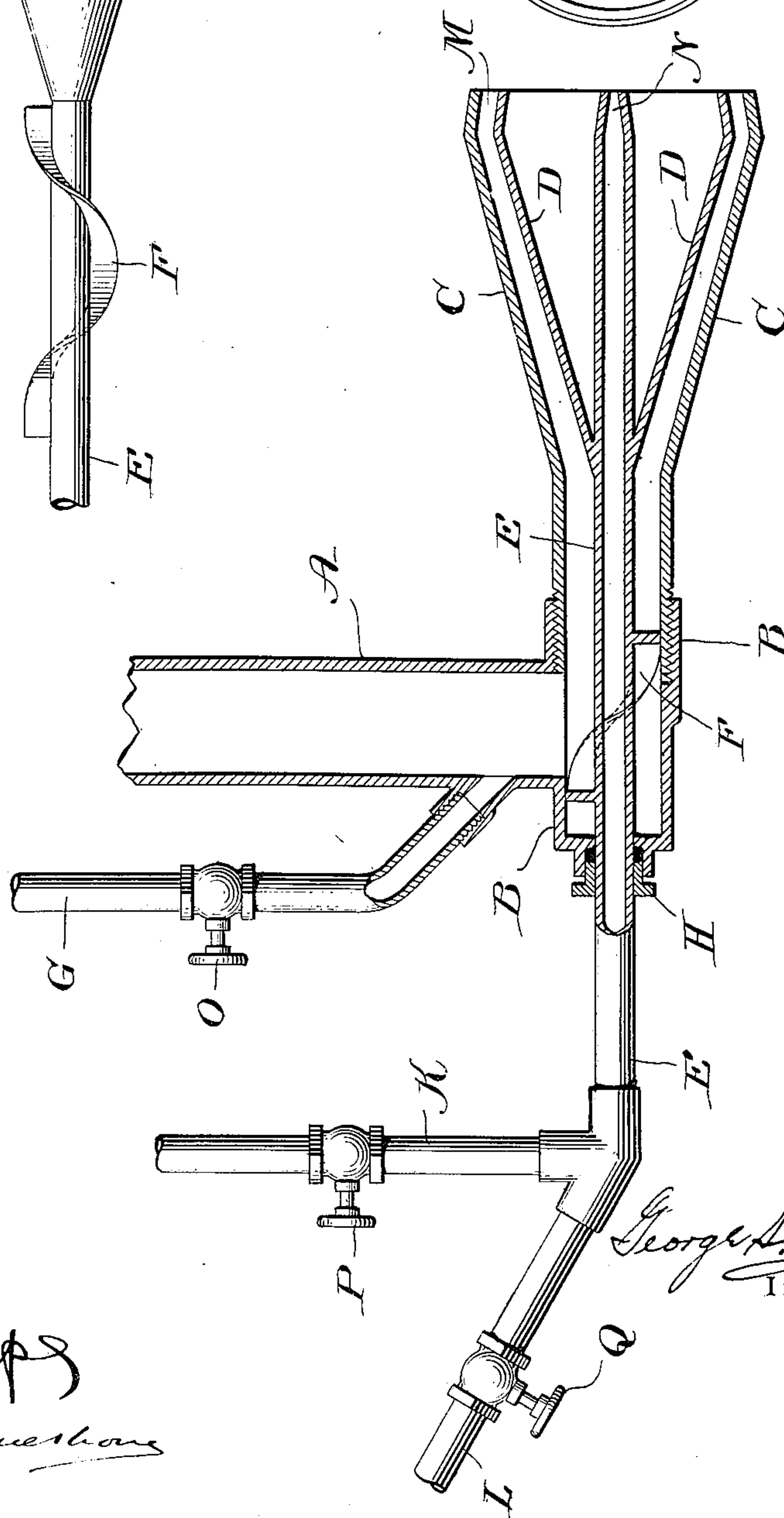


Fig. 1.



Witnesses.

A. V. Group
H. B. Dechermer

George S. Emerick
Inventor.

UNITED STATES PATENT OFFICE.

GEORGE S. EMERICK, OF PHILADELPHIA, PENNSYLVANIA.

GROUND AND FLUID FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 635,376, dated October 24, 1899.

Application filed July 6, 1899. Serial No. 722,914. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. EMERICK, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Ground and Fluid Fuel Burners, of which the following is a specification.

My invention relates to burners for ground or pulverized fuel or any combustible fluid, such as oil.

The defect hitherto existing in ground-fuel burners has been that the fuel was driven from them into the kiln or furnace in such manner that it would pass through a considerable portion of the furnace before igniting, thus tending to yield only an imperfect combustion.

The object of my improvement is to provide a means whereby ground fuel shall be discharged from the burner in such manner as to secure a more immediate and complete combustion than is obtained by existing devices. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view, partly in vertical section, of the burner and its connections. Fig. 2 is an end view of the discharge-orifice for the fluid fuel and of the cones forming the annular discharge-orifice for the ground fuel. Fig. 3 is a side view of the inner of the two cones above referred to, with a portion of the fluid-fuel pipe, showing the screw-flange mounted thereon.

In Fig. 1, B is a cylindrical chamber with which the feed-pipe A communicates. The outer cone C is adjustably secured to one end of the cylindrical chamber B in a manner hereinafter more particularly described. The pipe E passes through the cylindrical chamber B concentric therewith and terminates in the orifice N.

H is a gland forming a tight joint at the point where the pipe E passes through the end of the cylindrical chamber B.

K and L are pipes communicating with the pipe E and furnished with the valves P and Q, respectively.

F is a screw-flange mounted upon the pipe E within the cylindrical chamber B, as shown in Fig. 3.

D is a cone mounted upon the pipe E concentric to the cone C.

The position of the cones C and D concentric to each other is shown in Fig. 2, in which M is the annular discharge-orifice between the cones C and D.

G is a pipe communicating with the pipe A immediately above the junction of the latter with the cylindrical chamber B.

O is a valve governing the pipe G.

The operation of my ground and fluid fuel burner is as follows: When ground fuel is to be used therein, it is introduced through the feed-pipe A into the cylindrical chamber B, any suitable valve or other means being employed to regulate the passage of the fuel through said feed-pipe. Steam or compressed air supplied through the pipe G and controlled by the valve O operates to drive the fuel through the cylindrical chamber B and through the annular orifice M between the cones, a rotary movement being imparted to the fuel in its passage by the screw-flange F. It is important that the divergent lines of discharge should not cause the unburned fuel to impinge against the walls of the kiln or furnace, as that would result in imperfect combustion. The edges or lips of the cones C and D are accordingly bent inward slightly, as shown in Fig. 1, the course or direction taken by the fuel in its passage through the cones being first divergent and lastly slightly reëntrant. The above-described direction of discharge, together with the annular form of the same and the rotary movement imparted to the fuel, combine to secure an efficient and complete combustion.

In order to further control or modify the discharge of fuel from the annular orifice M, Fig. 1, the outer cone C is adjustably secured to the cylindrical chamber B either by being screwed therein, as shown, or by being arranged to slide therein, as in a sleeve. By reason of the reëntrant lip of the cone C any outward or inward movement of the latter operates to increase or decrease the width of the annular orifice M.

When any combustible fluid is employed as fuel, it is fed through the pipe K, its flow being regulated by any suitable valve, such as P, and is driven through the pipe E and nozzle N by steam or compressed air supplied through the pipe L and regulated by any suitable valve, such as Q.

What I claim as my invention, and desire to secure by Letters Patent, is—

In combination in a ground and fluid fuel burner, the cylindrical chamber B, the pipe
5 E mounted therein and concentric therewith, the outer cone C adjustably secured to the cylindrical chamber B, the inner cone D mounted upon the pipe E concentric with the
10 outer cone C leaving an annular space between said cones C and D, the sides of said cones flaring outwardly and their lips having a slight inward bend or deflection, means
such as the feed-pipe A for introducing ground
15 fuel into the cylindrical chamber B, means such as the pipe G for imparting velocity to

said fuel by pressure during the passage of said fuel through the burner, the screw-flange F mounted upon the pipe E within the cylindrical chamber B imparting a rotary movement to said fuel in its passage through the
20 burner, the pipe K communicating with the pipe E and supplying fluid fuel thereto and the pipe L imparting velocity to said fluid fuel by pressure during the passage of said fluid fuel
25 through the pipe E, substantially as described and for the purposes set forth.

GEORGE S. EMERICK.

Witnesses:

J. HOWARD RHOADS,
C. VICTOR EMERICK.