

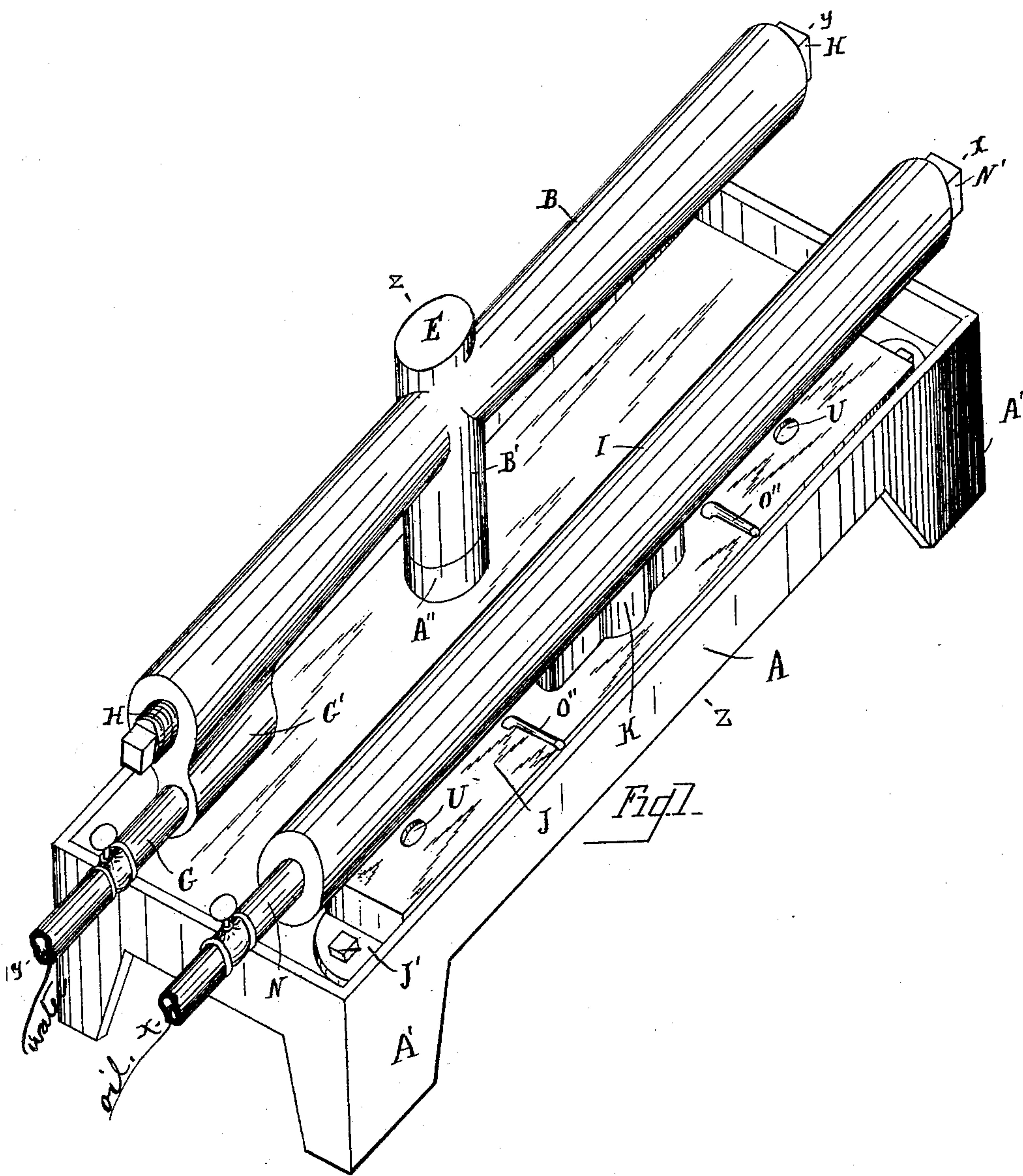
(No Model.)

2 Sheets—Sheet 1.

J. D. BLAKELEY.
HYDROCARBON VAPORIZER AND BURNER.

No. 424,700.

Patented Apr. 1, 1890.



WITNESSES

Carroll J. Webster.
Anna J. Lehaney.

INVENTOR

John D. Blakeley
By William Webster
Atty

(No Model.)

2 Sheets—Sheet 2.

J. D. BLAKELEY.
HYDROCARBON VAPORIZER AND BURNER.

No. 424,700.

Patented Apr. 1, 1890.

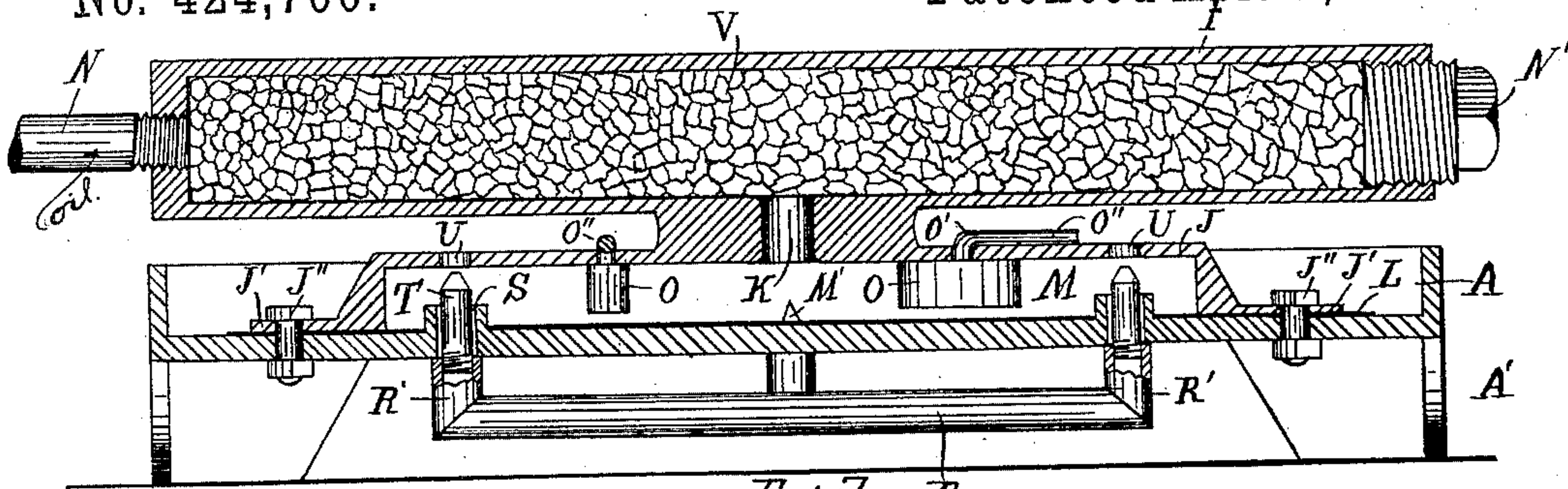


Fig. 2

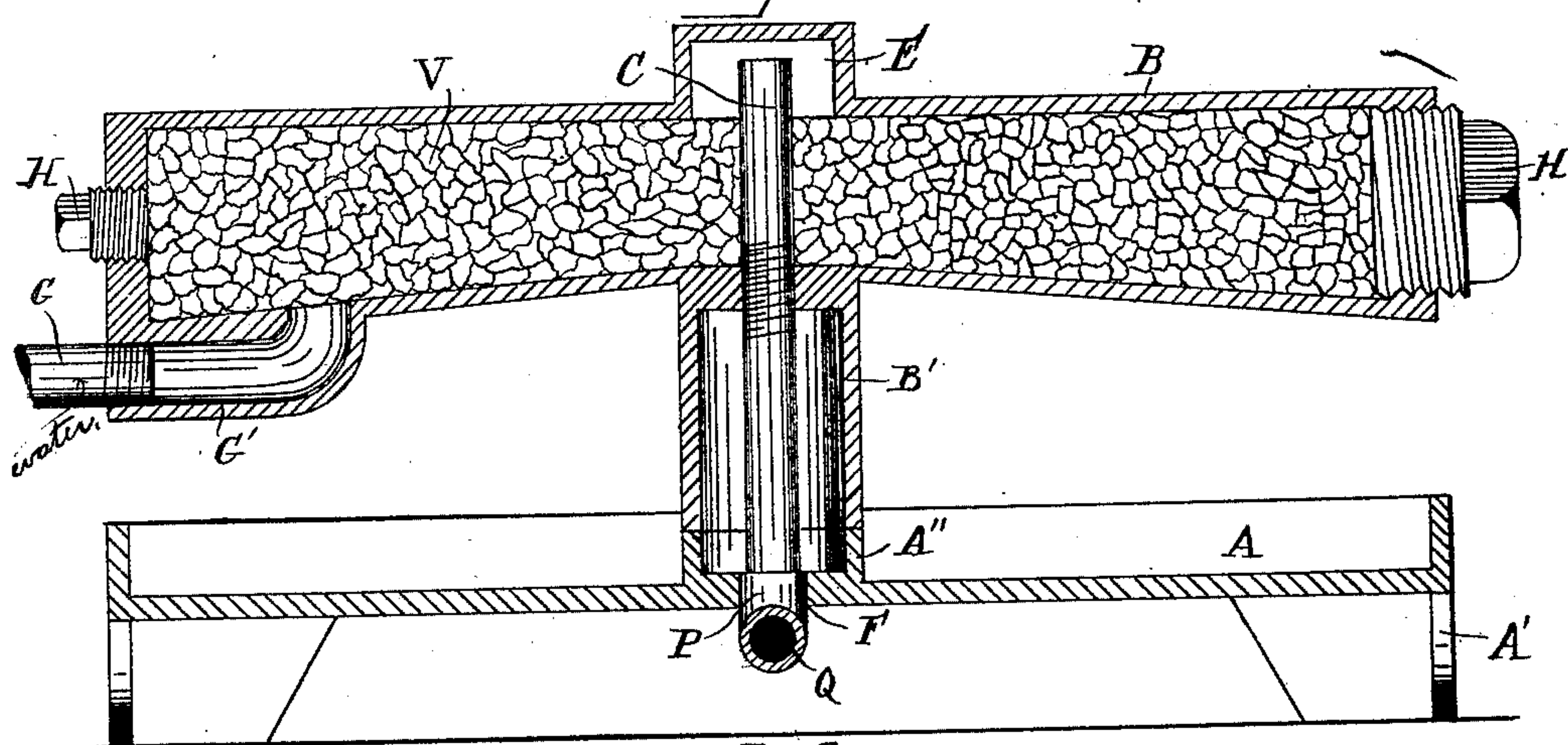


Fig. 3

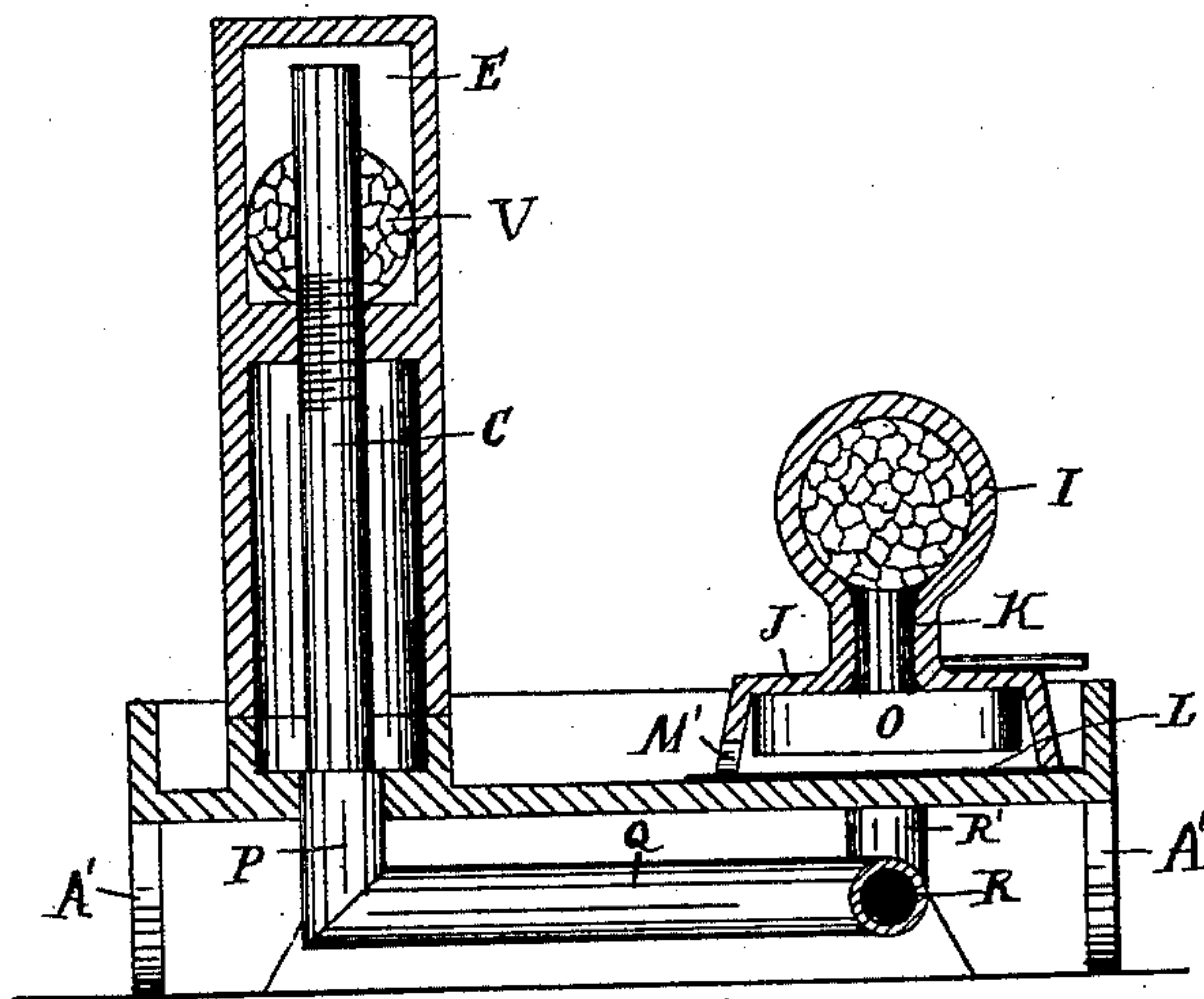


Fig. 4

WITNESSES

Carroll J. Webster,
Anna J. Lehaney.

INVENTOR

John D. Blakeley
By William Webster
Atty

UNITED STATES PATENT OFFICE.

JOHN D. BLAKELEY, OF TOLEDO, OHIO, ASSIGNOR TO DAVID H. COMMAGER,
OF SAME PLACE.

HYDROCARBON VAPORIZER AND BURNER.

SPECIFICATION forming part of Letters Patent No. 424,700, dated April 1, 1890.

Application filed September 30, 1889. Serial No. 325,506. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. BLAKELEY, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Hydrocarbon Vaporizers and Burners; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to hydrocarbon vaporizers and burners of that class adapted for use for the combustion of petroleum-oils, either crude or refined, for generating heat for domestic use, or for generating steam in engine-boilers.

The object of the invention is to provide means for thoroughly vaporizing the oil prior to leading the same to the point of combustion.

A further object is to provide a generator of novel form, for the vaporization of water permitted to flow therein, with conduits, whereby the steam shall issue in jets through the ports through which the hydrocarbon vapor is passed, thereby intimately commingling the steam and hydrocarbon vapor with the external atmospheric air at the point of combustion.

A further object is to dry or superheat the steam by means of an inclined water-receptacle formed with a dome or retort at the upper side, into which the dry steam rises to enter the pipe for leading the same to the point of combustion.

A further object is to construct the steam and hydrocarbon-vapor generators to render it convenient to gain access to the same.

A further object is to pack the generators with granulated granite to insure an intensified heat to the whole internal area of the same to more thoroughly vaporize the water and oil.

A further object is to provide for regulating the flow of hydrocarbon vapor to the point of combustion by means of dampers located within the receptacle for the vapor.

The invention consists in the parts and combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a complete burner. Fig. 2 is a longitudinal vertical section on lines *x x*, Fig. 1. Fig. 3 is a longitudinal vertical section on lines *y y*, Fig. 1. Fig. 4 is a transverse section on lines *z z*, Fig. 1.

A designates a rectangular pan supported upon legs A', preferably formed integral therewith.

B designates a cylindrical water-receptacle formed with a depending annular boss B', which rests upon a boss A'', formed upon the upper surface of the pan A, whereby there is formed a chamber for the reception of a steam-pipe C, leading from a dome E, formed in the upper side of the water-receptacle and passing through a perforation F, formed in the bottom of pan A centrally of boss A'', the central portion of pipe C being threaded and screwed through the bottom of cylinder B, as shown in Fig. 3.

Cylinder B is preferably horizontal upon the top and inclined in either direction from the center upon the lower side, whereby there are formed at each end of the cylinder enlarged portions for containing water for vaporization, the water being conducted thereto through a pipe G, tapped into a boss G', formed upon the under side of the cylinder.

H designates plugs tapped into each end of the cylinder, by which means access is gained to the interior of the same.

I designates a cylindrical oil receptacle and vaporizer formed with a hollow base J, rectangular in cross-section and of slightly less length than the interior of pan A, the base being connected with the cylinder I by an integral pipe K, preferably oblong in cross-section, to insure greater strength, the pipe communicating with the cylinder and hollow base.

J' designates outwardly-turned flanges perforated to receive bolts J'', which also pass through the bottom of pan A and also through a packing L of asbestos, whereby there is formed a steam-tight chamber N for the reception of vapor generated in cylinder I, as will be more fully described.

N designates a pipe leading from the oil-

supply and tapped into one end of cylinder I, the opposite end of the cylinder being closed by a removable plug N' tapped therein.

O designates dampers secured within chamber M upon rods O', which pass through perforations formed in the top of the chamber and are bent at right angles to form handles O''. The front inclosing side of chamber M has a V-shaped notch M' cut therein, for a purpose hereinafter stated.

Pipe C extends from the steam-dome E through perforation F in the bottom of pan A, at which point it is screwed into a coupling P of a pipe Q, which extends beneath and transversely of the pan A to near the front side, at which point it is connected with a pipe R, running parallel with the front side of the pan and directly beneath chamber M, the pipe being turned at right angles, as at R', and extending through perforations S, formed in the bottom of the pan, the pipe terminating in nozzles T, which extend to near the top of chamber M and coincident with perforations U, formed in the top thereof.

V designates a packing of pulverized granite, with which each cylinder is packed, it having been found that this packing when subjected to heat will retain and diffuse the same throughout the entire internal diameter of the cylinder, thereby causing a thorough and even vaporization throughout the same.

In operation, to start a fire, oil is admitted to cylinder I and flows through the interstices formed between the granular packing and down through pipe K upon the bottom of pan A within chamber M, and flows through the V-shaped opening M', when it is ignited, the flame rising and enveloping cylinder I, which is soon heated to a degree to vaporize the oil therein, when the vapor flows down pipe K, instead of oil, as heretofore, and finds an exit through openings U, where it is ignited and in combustion envelops both cylinders I and B, heating the same to an intense degree. Water is admitted to cylinder B as soon as the vapor is ignited, and the heat soon vaporizes the water therein, the steam or vapor rising to the dome E, and, descending pipe C, flows through pipes Q and R, and finds an exit through the nozzles T, and unites with the hydrocarbon vapor at the exit from chamber M at a time when the commingled vapors unite with atmospheric air to support combustion. By reason of the enlargement of the water-chamber at the lower side thereof there is always a supply of water for vaporization, which throws off a steam that becomes superheated in its ascent through the granular packing, and rising into the dome insures a steady pressure of live steam to be fed to the nozzles U, thereby preventing the unsteady pressure and consequent intermittent flow where there is no water-reservoir and distinct steam-dome. The pressure of steam as it escapes through openings T tends to draw the hydrocarbon vapor from the chamber M, and thereby effect a thorough in-

termingling of the hydrogen therewith, and as thus mixed the vapor is consumed at a point where the atmospheric air combines to support combustion. By reason of the granite packing within the hydrocarbon-chamber I the process of percolation through the interstices causes the oil to be thoroughly vaporized before passing to the chamber M. By means of the damper O the flow of hydrocarbon vapor to the point of combustion can be regulated to a nicety.

It will be seen that the pan and cylinders consist of but three pieces, and the usual multiplicity of parts and expensive fittings are entirely dispensed with.

A further advantage in the present construction is that the openings through which the hydrocarbon vapor is passed are of a size to permit the combustion of crude petroleum without the usual gumming and coating of residuum, as should any coke, carbon, or residuum of any character tend to lodge thereon the force of superheated steam finding egress therethrough will dislodge the same.

What I claim is—

1. In a hydrocarbon vaporizer and burner, the combination, with a steam-generator enlarged at each end and provided with a central steam-dome, of an oil-vapor generator, a supplemental chamber arranged beneath the latter generator and connected therewith, and a steam-pipe extending from the steam-dome and entering the supplemental chamber at the bottom, said supplemental chamber being provided with an opening for the escape of vapor in vertical alignment with the end of the steam-pipe, and also an opening near the bottom of the same for the escape of oil into a flash-pan, substantially as shown and described.

2. In a hydrocarbon vaporizer and burner, the steam-generator B, enlarged at each end and provided with suitable plugs and filled with granular material, a central steam-dome, an integral support, a tubular boss at one end, into which is tapped the supply-pipe, and a steam-exit pipe tapped through the integral support and extending into the steam-dome, substantially as shown and described.

3. In a hydrocarbon vaporizer and burner, the combination, with a pan or support, of an oil-vapor generator, a supplemental chamber arranged beneath the vapor-generator and connected therewith, said chamber being secured to the pan or support, steam-pipes passing through the bottom of the pan and entering the supplemental chamber, said chamber being provided with apertures in its top in vertical alignment with the steam-pipes, and an eccentric-shaped damper adapted to regulate the flow of vapor, substantially as shown and described.

4. An improved hydrocarbon vaporizer and burner consisting of the pan or support, the steam-generator enlarged at each end and provided with a central steam-dome, integral

tubular boss, support and openings at each
end provided with plugs, the oil-vapor gen-
erator arranged in parallel relation with the
steam-generator, and also provided with suit-
5 able plugs, a supplemental chamber arranged
beneath the vapor-generator, and an integral
tubular portion connecting the generator and
chamber, said chamber being provided with
an orifice in its side and apertures in its top,
10 a steam-pipe extending from the steam-dome
to the supplemental chamber, said pipe be-
ing arranged directly beneath the apertures

in the top of the chamber, and the dampers
for regulating the escape of vapors, all ar-
ranged and adapted to operate substantially 15
as shown and described.

In testimony that I claim the foregoing as
my own I hereby affix my signature in pres-
ence of two witnesses.

JOHN D. BLAKELEY.

Witnesses:

FRANCIS E. WRIGHT,
HARRY W. BECK.