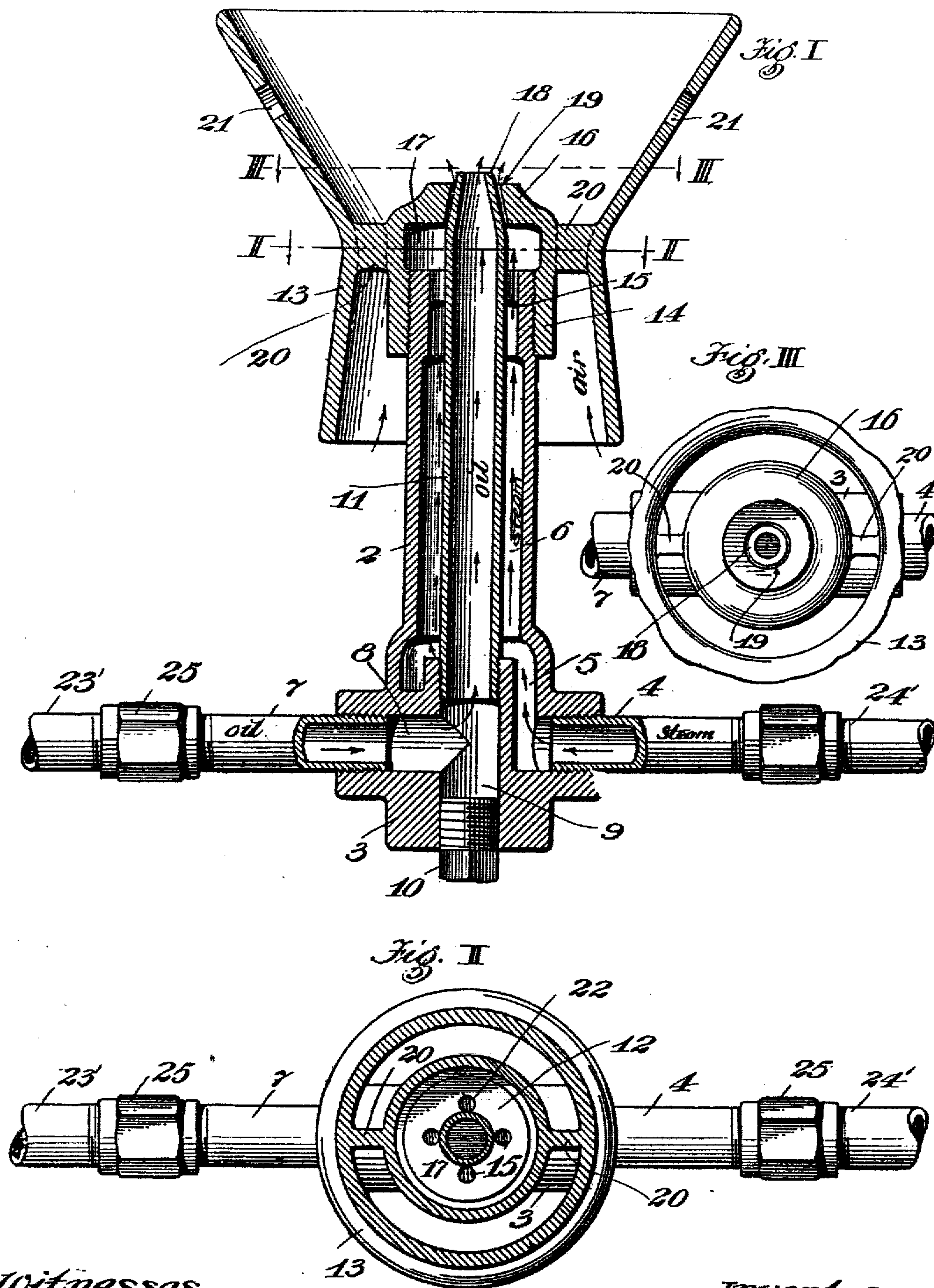


J. SCHURS.

HYDROCARBON BURNER FOR BRICK KILNS.

APPLICATION FILED APR. 8, 1903.

2 SHEETS—SHEET 1.



Witnesses
Samuel A. Strauss
Fredrick Skye

Inventor
John Schurs
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his attys.

No. 784,126.

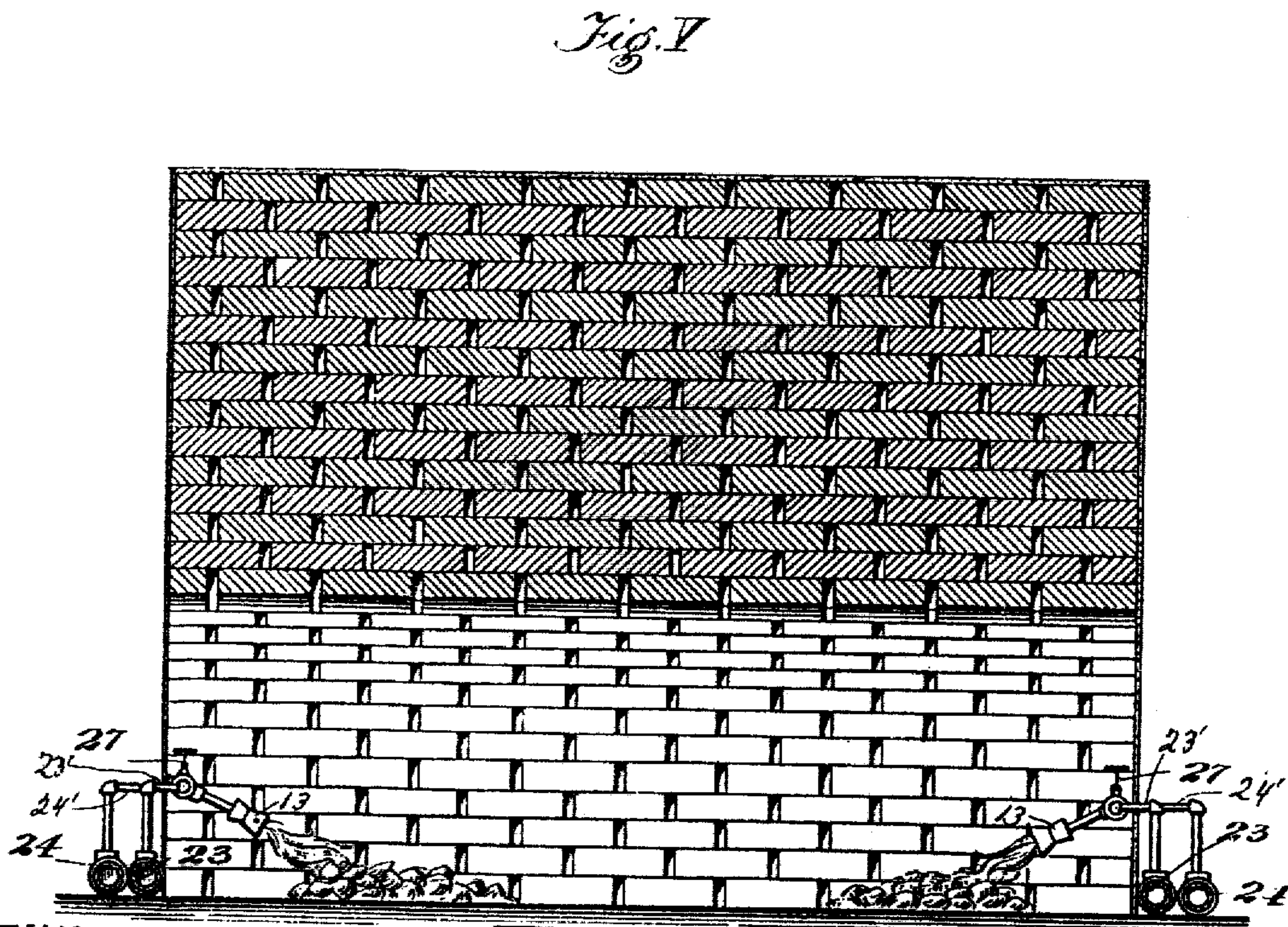
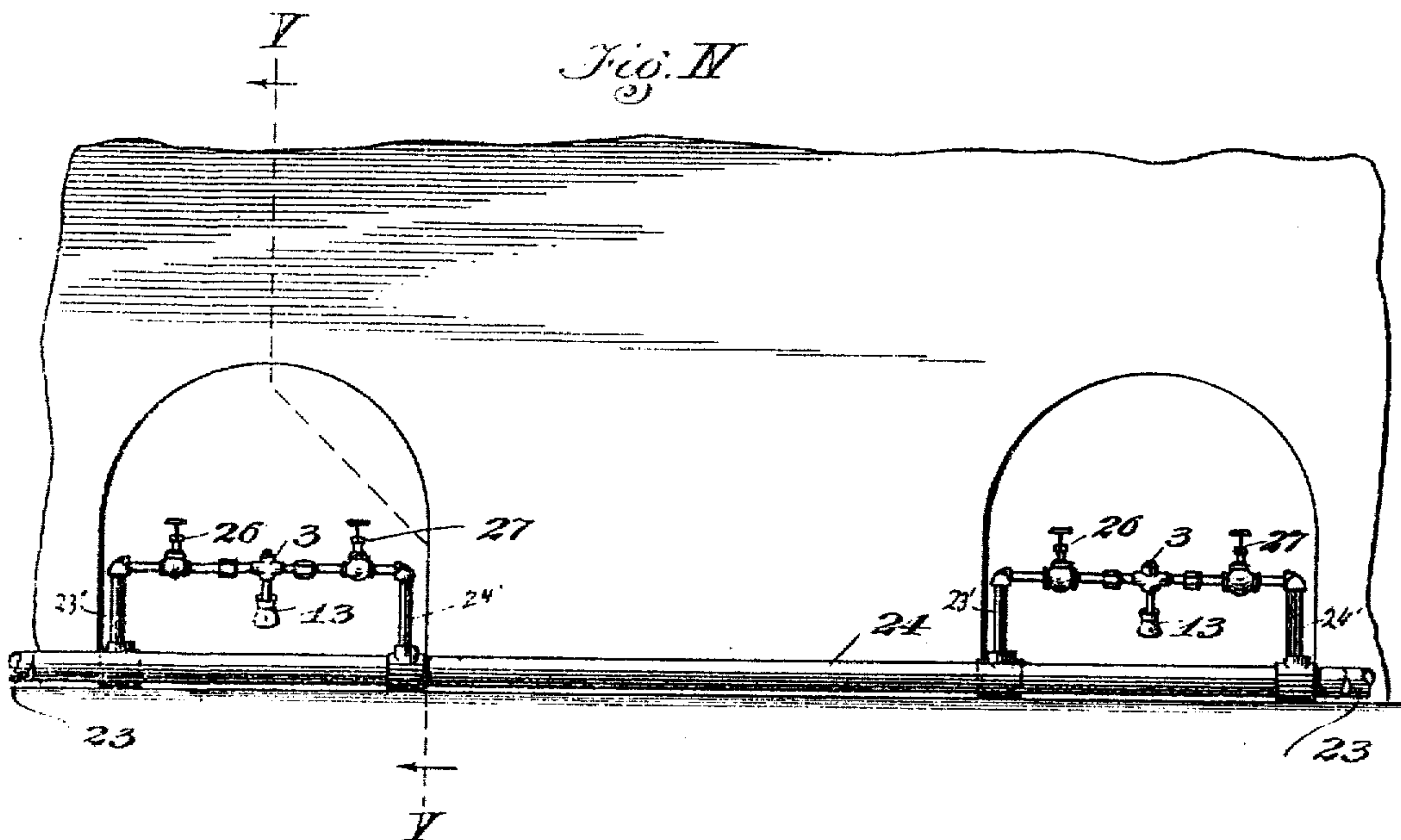
J. SCHURS.

PATENTED MAR. 7, 1905.

HYDROCARBON BURNER FOR BRICK KILNS.

APPLICATION FILED APR. 6, 1903.

2 SHEETS—SHEET 2.



Witnesses

Edmund A. Strauss
Frederick S. Hyde

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UNITED STATES PATENT OFFICE.

JOHN SCHURS, OF LOS ANGELES, CALIFORNIA.

HYDROCARBON-BURNER FOR BRICK-KILNS.

SPECIFICATION forming part of Letters Patent No. 784,126, dated March 7, 1905.

Application filed April 6, 1903. Serial No. 151,225.

To all whom it may concern:

Be it known that I, JOHN SCHURS, a citizen of the United States of America, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain Improvements in Hydrocarbon-Burners for Brick-Kilns, &c., of which the following is a specification.

My invention relates to means for atomizing and breaking up heavy hydrocarbons and mixing therewith a sufficient quantity of steam and air to insure the ready thorough combustion thereof and to such means particularly adapted for use in burning brick.

A further object of the invention is to provide such means in such form that the blast-flame therefrom may be directed as desired and in which the mixed steam and oil as they emerge from the burner are admixed with atmospheric air and drawn into a surrounding hood by the suction created by the blast.

Other and further objects and ends in view will hereinafter appear from the detailed description of construction and operation.

The invention consists in general in the constructions and combinations of parts, all as hereinafter described, and particularly pointed out in the claims, and will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure I is a longitudinal sectional view of a burner embodying my invention. Fig. II is a plan view thereof on the line II II of Fig. I. Fig. III is a plan view thereof on the line III III of Fig. I. Fig. IV is a partial side view of a brick-kiln, showing the burning-tunnels provided with hydrocarbon-burners embodying my invention. Fig. V is a transverse sectional view thereof on the line V V of Fig. IV.

As shown in the drawings, 2 represents the main body of an atomizing-burner into the base 3 of which enters from one side the steam-pipe 4, communicating with the duct 5, which in turn communicates into the central chamber 6 of the body 2. An oil-pipe 7 communicates through the port 8 into the central duct 9 in the base 3. The outer end of the duct 9 is preferably closed by a removable plug 10, by means of which access may

be had to the duct 9 for the purpose of cleaning. Into the outer or forward end of the duct 9 is threaded the oil-pipe 11, which extends through the chamber 6, as shown, and projects through the closed end 12 of the body 2 and a short distance beyond the end thereof. Said closed end has perforations 22, permitting passage of steam therethrough. The outer end of this oil pipe or tube 11 is contracted in the form shown.

13 represents a hood, which is preferably circular in cross-section and has a portion 14, which is also preferably circular in cross-section and located axially within the hood. The portion 14 virtually forms a short tube, one end or portion of which, 16, is closed and provided with a perforation 19, through which projects the contracted discharge end of the oil-pipe 11, and the other end is open and provided with a thread adapted to engage and thread upon the outer or forward end of the body 2. An expansion-chamber 17 is formed between the end 12 of the body 2 and the portion 16 of the hood, and an annular steam-discharge slot is provided between the periphery of the discharge end 18 of the oil-tube and the wall of the portion 16. As shown, this annular discharge-slot conforms to the taper of the end 18, so as to form a converging outlet surrounding the oil-outlet. The steam emitting from the expansion-chamber 17 through this discharge 19 is directed inwardly into the body of oil emitted from the oil-pipe 11, and as the steam expands into the oil the oil is thoroughly broken up and atomized. To enable the full effect of this expansion and convergence of the steam into the oil, it is necessary that the oil-outlet be free, as shown—that is, without any obstruction by valve or similar means against which the oil and steam would strike and interfere with the forward movement thereof. The body of oil being completely surrounded by the inwardly-projected annular converging current of steam, the thorough atomization thereof is insured. The portions 14 and 16 are connected with the main body of the hood by means of ribs 20, preferably formed integral therewith and with the main body of the hood. As shown, the wall of the hood

flares outward from the ribs 20, giving the forward portion of the hood a conical form, the space within the wall of the hood being greatest at its outer end. The portion of the hood projecting rearwardly from the ribs 20 also flares outwardly, as shown. Both ends of the hood are open, and air may pass freely from the rearward end through and out the forward end. 21 represents auxiliary air-inlets in the wall of the forward portion of the hood. The closed end 12 of the body 2 is provided with a series of ducts or ports 22, through which the steam may pass from the chamber 6 into the chamber 17 and then out through the discharge-outlet 19.

23 represents a suitable oil-supply pipe. The oil-supply pipe 23 is suitably connected with the oil-pipe 7, as by a union 25. The steam-pipe 24 is preferably similarly connected with the steam-pipe 4, so that the position of the burner may be adjusted as desired.

The burner is connected with the pipes 23 and 24 by means of branches 23' and 24', which preferably rise vertically a suitable distance and are then bent laterally, preferably one farther than the other, and then forward and in alinement with each other to the unions. By connecting the burner in this manner the pipes 23 and 24 can lie side by side on the ground, as shown in Figs. 4 and 5, and the burner will occupy a position where it can be conveniently manipulated and regulated, and the flame can be thrown in the desired direction—downward, upward, or horizontally. The burner is pivotally mounted on said branches with its pivotal axis in alinement with said branches, so that it can be turned freely in angular position, and, moreover, the burner extends radially from its pivotal axis, so that a change in angular position does not necessitate any movement of translation or longitudinal movement that might be undesirable.

26 27 represent valves by means of which the supply of oil and steam may be regulated.

In burning brick it is necessary that a small heat be provided at the commencement of the burning for ten or fifteen hours, after which an increased heat is desired. By the use of my hood a small flame may be maintained, the hood protecting the flame at the burner-tip from any rush of air blowing out the flame. The hood taking in air at the side of the body and behind the point of admixture of steam and oil insures a sufficient supply of air and prevents blowing out of the flame. At the commencement of burning the flame is preferably projected down upon bricks or stones on the bottom of the tunnel. When the bricks surrounding the tunnel have been partially burned, it is desirable to increase the heat, and a better effect can be produced by projecting the flame from the burner upward. I therefore so construct

my burner as to provide for this change of direction of the flame.

The forward wall of the hood is outwardly flared, so that all requisite space is provided for the burning vapor without any superfluous projecting against the wall of the hood, avoiding any condensation thereon, also avoiding carbonization on the hood.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a hydrocarbon-burner, a hollow cylindrical body provided with means for feeding steam thereto, and having its forward end closed and provided with longitudinally-arranged perforations, a flaring hood on the closed end of said body having a central portion open at one end to engage and fit over the forward end of said cylindrical body and having a perforated wall at its forward end, said hood being provided with ribs connecting it with said central portion and the said central portion having a chamber between its ends forming an expansion-chamber in communication with the perforations of the body and of the central portion, and an oil-pipe through said body with its forward end projecting through the perforation of said central portion.

2. In a hydrocarbon-burner, in combination, a body having a central chamber with a perforated end, a steam-inlet into said chamber, a steam-supply pipe connected to said inlet, an oil-pipe extending longitudinally through said chamber and projecting through and beyond said end, an oil-supply pipe connected with the rear end of said oil-pipe and a hood mounted upon said body and provided with a forwardly-flaring portion forming an expansion-chamber for the steam from said first-named chamber beyond the perforated end thereof, said oil-pipe provided with a tapered or conical end projecting through the end of said expansion-chamber and said hood being formed with a converging annular steam-outlet surrounding said tapering end through which steam is discharged from said expansion-chamber into the oil from said oil-pipe.

3. In a hydrocarbon vaporizer and burner in combination, a body provided with a central chamber, a steam-pipe connected with said chamber, an oil-pipe extending longitudinally therethrough, an oil-supply pipe connected therewith, a hood mounted upon the discharge end of said body and provided with a central portion through which the end of said oil-pipe extends and an annular discharge-slot provided between the wall of said portion and the discharge end of said oil-pipe through which steam is discharged from said central chamber, said hood provided with an outwardly-flaring wall extending beyond the end of said oil-pipe, and air-inlets provided in said flaring wall and

with a rearwardly-extending tubular portion through which air is drawn into the atomizing and burning vapor.

5 4. In a hydrocarbon-burner a hollow cylindrical body provided with means for feeding steam thereto and having its forward end closed and provided with longitudinally-arranged perforations, a flaring hood on the closed end of said body having a central portion open at one end to engage and fit over
10 the forward end of said cylindrical body and having a perforated wall at its forward end, said hood being provided with ribs connecting it with the said central portion and the
15 said central portion having a chamber between its ends forming an expansion-chamber in communication with the perforations of the body and of the central portion and an oil-pipe extending from said body and communicating through the perforation of said
20 central portion.

5. In a hydrocarbon-burner a hollow cylindrical body provided with means for feeding steam thereto, a flaring hood on the end of said body having a central portion open
25 at one end to engage and fit over the forward end of said cylindrical body and having a perforated wall at its forward end, said central portion having a chamber between its ends forming an expansion-chamber in
30 communication with said body, and an oil-pipe extending through said body and communicating through the perforation of said central portion.

In testimony whereof I have hereunto set
35 my hand, this 28th day of March, A. D. 1903, in Los Angeles, in the county of Los Angeles and State of California.

JOHN SCHURS.

In presence of—

FREDERICK Q. LYON,
JULIA TOWNSEND.