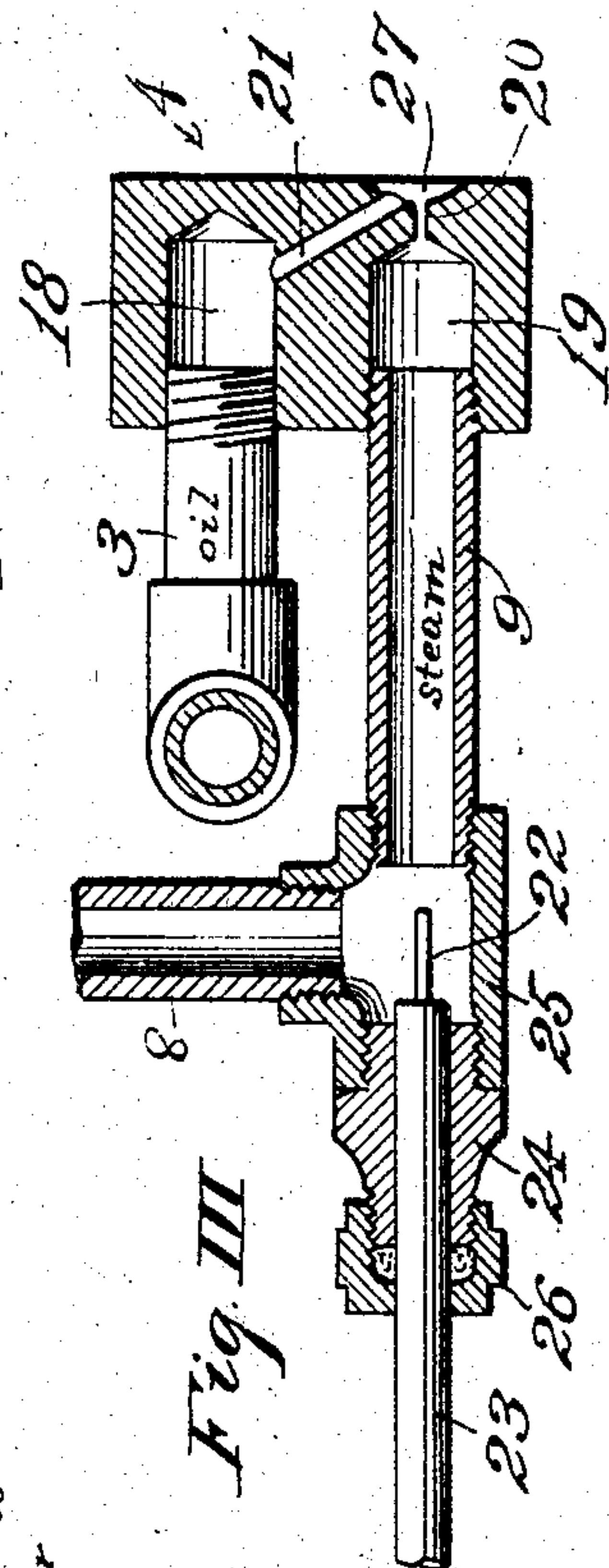
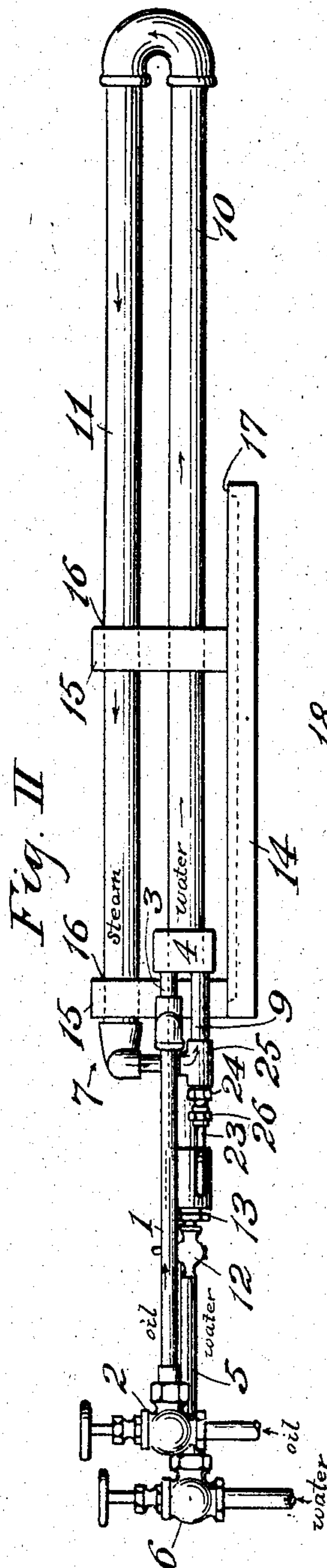
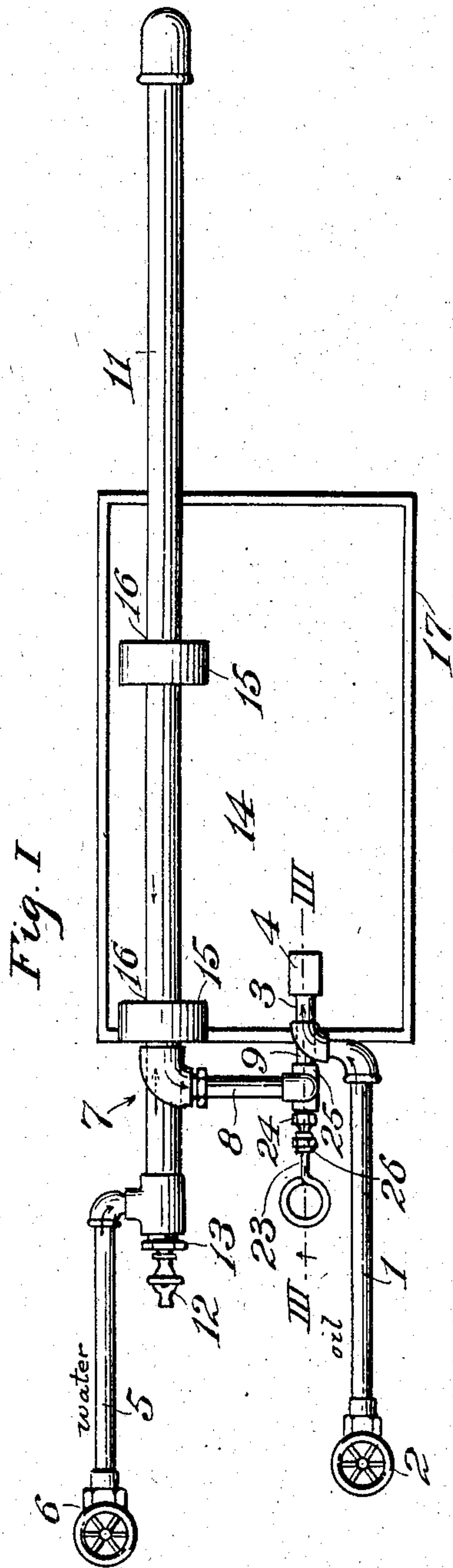


No. 791,812.

PATENTED JUNE 6, 1905.

J. PALMATARY.  
OIL BURNING APPARATUS.  
APPLICATION FILED DEC. 21, 1903.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JAKE PALMATARY, OF LOS ANGELES, CALIFORNIA.

## OIL-BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 791,812, dated June 6, 1905.

Application filed December 21, 1903. Serial No. 186,120.

*To all whom it may concern:*

Be it known that I, JAKE PALMATARY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented Improvements in Oil-Burning Apparatus, of which the following is a specification.

An object of this invention is to provide an improved oil-burning apparatus of the class in which steam for operating the burner is generated in an appliance heated by the flame of the burner and forming a part of the apparatus.

An object is to so construct and arrange the parts of the apparatus that at all times while the burner is in operation a mild heat appropriate for producing the requisite steam-pressure will be applied to the steam-generator in a superior manner and destructive action of the flame on the generator will be avoided.

Another object is to provide for perfect combustion under ordinary conditions and to produce a flame that will spread out through a fire-box or furnace or steam-boiler, so as to heat the same with great efficiency, but without destructive action of the blaze.

Another object is to provide means for a simple and convenient arrangement of parts whereby the starting of the burner into operation is facilitated, the operator being able to shift the starting-pan as desired.

The invention further relates to features of construction, as hereinafter set forth and claimed.

The accompanying drawings illustrate the invention.

Figure I is a plan of the improved oil-burning apparatus. Fig. II is a side elevation thereof. Fig. III is a vertical section on the line III III in Fig. I.

1 designates an oil-supply pipe provided with a valve 2 and communicating by connection 3 with a burner-head or jet-piece 4. A pipe 5, connected with any suitable source of water-supply and provided with a valve 6, communicates with one end of a steam-generator 7, from whose other end a connection 8 leads to a pipe or tube 9, entering the burner-head or jet-piece 4. The steam-generator is desirably elongated, as by making it in the form

of a U-tube or a return-bend pipe having lower and upper legs or portions 10 11, the outer end of the lower portion being connected to the water-supply pipe 5 and the outer end of the upper portion communicating with the connection 8 aforesaid. The lower leg or portion 10 of the generator is preferably provided with a blow-off cock 12 to enable the contents of the generator to be blown off or drawn off when desired, said cock being preferably fitted into the end of the generator-pipe 10 by a screw-plug 13, which may be removed bodily to permit access to the interior of the generator for cleaning or inspection.

A firing-pan 14 is supported on the generator or is supported by it, as the case may be, by means of brackets or arms 15 on said pan provided with holes 16, whereby they fit over the respective legs 10 11 of the generator to hold the firing-pan in place. The pan may be slid along the generator to any suitable position, the legs being parallel to permit of such movement. Said pan is desirably provided with a raised outer rim or upturned flange 17 to retain oil thereon. The generator is located one side of the path of the burner-flame, so that said flame is left unobstructed, and its full heating effect can be exerted upon the object, such as a bake-oven or heating-chamber, that is to be heated, and the steam-generator is not subject to injury or deterioration by the direct action of the burner-flame, but receives only radiated heat. Moreover, as the flame does not strike the generator there is more perfect combustion than if the generator were located in the path of the flame, as in the latter case the flame would be cooled more or less, causing deposition of carbon and preventing complete combustion.

The burner-head 4 may consist of a block having an oil-passage 18 and a steam-passage 19, communicating together at or near the jet-orifice, the oil-passage having an inclined portion 21 leading into a sharply-flaring or cup-shaped mouth 27, wherein the oil meets the steam and is subjected to the ejecting and atomizing action of the current of steam, this depression being immediately beneath the steam-passage 19. The passages 18 and 19 are formed as two parallel holes or sockets, and



by inserting the pipes 3 and 9, respectively, into the outer or rear portion thereof the inner portions form chambers, the upper chamber being closed at its inner or forward end and the other one perforated axially, as at 20. The flaring mouth or depression 27 is arranged axially relatively to the perforation 20, and the passage or channel 21 is inclined from the upper socket or chamber to the upper portion of the mouth and at such an angle thereto that if extended it would pass over the perforation at the center and beyond the opposite wall without cutting the same, thereby permitting of its being formed without having the tool engage with said opposite wall. By constructing the head in this manner it can be cheaply formed from a single piece of material, as the chambers and mouth or depression can be drilled, thus avoiding joints, bolts, or screws necessary in a two-part head, and yet the oil-chamber has direct communication with the upper portion of the mouth, where the oil that is discharged therefrom is taken up by the escaping jet of steam directly below it and thoroughly divided or atomized and distributed in the most efficient manner for securing complete combustion. The head and the two pipes or legs of the generator lie in two parallel vertical planes adjacent to each other, and the connectors 8 and 9 between the end of the upper leg 11 of the generator and the head 4 are so short that the head and its connections are held rigidly in position without other support. The connections between the parts 8 and 9 and the other members being by the ordinary screw-joints, it is obvious that the same may be set or adjusted to desired angle for operation by simply turning the parts on the screw-joints; but the connection by the screw-joints is sufficiently tight to hold the same when once set or adjusted in fixed position, and the term "rigid" as applied in this connection is used in this sense. By constructing the firing-pan flat it forms a support for the burner in the furnace, if desired, or the pipe 7 of the generator may be secured in position, and thereby form a support for the generator and burner. The area of the pan is sufficient to extend laterally beyond both sides of the generator and head and also part way of the length of the generator-pipes, and the walls around it are of sufficient height to hold enough oil to start the generator irrespective of the position the pan occupies relatively to the length of the generator-pipes. The steam-communicating pipe 9 leads directly into said steam-passage in line with the jet-orifice 20, and a cleaning device 22 is arranged to traverse said steam-pipe and the steam-passage 19 to enter the jet-orifice 20, thereby enabling the latter to be cleaned when desired. Said cleaning device may consist of a pin on the end of a slide rod or bar 23, sliding in the head or plug 24, screwed into the outer end of fitting or T 25,

connecting the pipes 8 and 9, a handle or operating means being provided on the outer end of said bar. A packing or stuffing box 26 may be provided where rod 23 passes through the plug 24.

The apparatus may be used in the open or with any suitable fire-box, chamber, or furnace.

The burner-orifice 20 27 is located in the front flat face of the body 4, which forms a shield between the outlet and the rear of the burner. The steam issuing from the orifice in such flat face induces a vacuum effect around the axis of cavity 27, thus causing a radial inflow of air from the edges of the front face of block or body 4. The orifice is desirably located nearer the bottom of the front flat face of the burner body or block 4, so that the greater supply of air to fill the vacuum will come from below, thus exerting a tendency to lift and carry the oil by atmospheric pressure in addition to the force of the steam-jet. This desirable effect is heightened by giving the block 4 a rectangular form, so that the shortest distance the air-supply from the rear of the block must travel to supply the vacuum formed around 20 by the entraining action of the steam will be along vertical and horizontal lines from below and both sides. The result is that the oil is upheld, mingled with the air, and brought to combustive reaction therewith in a superior manner, and both the steam-generator and the fire-box, furnace, or boiler, as the case may be, are heated economically without being subjected to severe heats.

The steam-generator, consisting of the two parallel pipes 10 11, is arranged alongside and parallel with the extended axis of the steam-outlet 20 and mainly above the level thereof, so that the heat is applied therealong in an effective manner, but without materially disturbing or breaking up the flame, and the higher heat of the flame is applied to the steam-pipe 11.

The cupped or concave form of the cavity 27 in the otherwise flat face of the block 4 allows the entrained air to begin to mingle with the steam immediately below the place where the oil reaches the steam.

The operation may be described as follows: The valve 2 is opened to permit oil to flow through pipe 1, connection 3, and burner-head 4 to the firing-pan, where it is ignited by suitable means. When the steam-generator becomes sufficiently warmed by the heat from the combustion of the oil on the firing-pan, valve 6 is opened to permit passage of water to the generator, the water being turned on very gradually at first, so that it will practically be converted into steam by the time it reaches the farther end of the generator. The water passes along the lower portion 10 of the generator and is heated therein, then returning along the upper or return pipe 11 of



the generator it is again subjected to the heat of the flame 1 over the firing-pan and completely converted into steam. The steam thus generated passes by connections 8 and 9 to the steam-passage of the burner-head, where it meets the oil coming from oil-passage, entraining and ejecting the oil from the jet-orifice 20 with such speed as to atomize the oil and insure its dispersion into the air in the combustion-chamber. The oil so atomized and distributed will burn with an extremely hot flame, and the steam-generator 7 will thereby be rapidly heated to an extent sufficient to allow the water-valve 6 to be turned on more fully, permitting the full flow of water to the generator and converting all of the water thus passing in the generator to steam before it reaches the delivery end thereof. According to the amount of water thus supplied the steam may be delivered from the generator either wet or dry or superheated, as desired.

What I claim is—

1. In an oil-burning apparatus, two pipes, one above the other and communicating at their farther ends, means for feeding water to the lower pipe, a head at one side of said pipes and provided with two openings, one above the other at one end and communicating at the other end, means for rigidly connecting the upper pipe directly with the lower opening in the head, an oil-supply communicating with the upper opening in the head, and a firing-pan connected with the said pipes for supporting the same or being supported thereby and extending under the head and the rear portion of said pipes.

2. In an oil-burning apparatus, two pipes, one above the other and communicating at their farther ends, a head at the side of said pipes provided with two openings, one above the other at one end and communicating at the other end, short pipes for rigidly connecting the lower opening of the head directly with the upper pipe, means for supplying the lower pipe with water, means for supplying the upper opening in the head with oil, a flat firing-pan provided with a rim and two vertical arms, said arms engaging movably with said pipes and the pan extending laterally beyond the head and the pipes and part way of the length of said pipes.

3. An oil-burning apparatus comprising a burner, oil-supply means therefor, a steam-generator consisting of a return-bend pipe whose outgoing and return legs or portions are located one below the other and in heat-receiving relation to the burning flame, a water-supply connection to the lower leg of the generator, a steam-supply connection from the upper portion thereof to the burner, and a firing-pan having supporting-arms engaging the lower and upper portions of the generator, and slidable along same.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California, this 14th day of December, 1903.

JAKE PALMATARY.

Witnesses:

ARTHUR P. KNIGHT,  
JULIA TOWNSEND.