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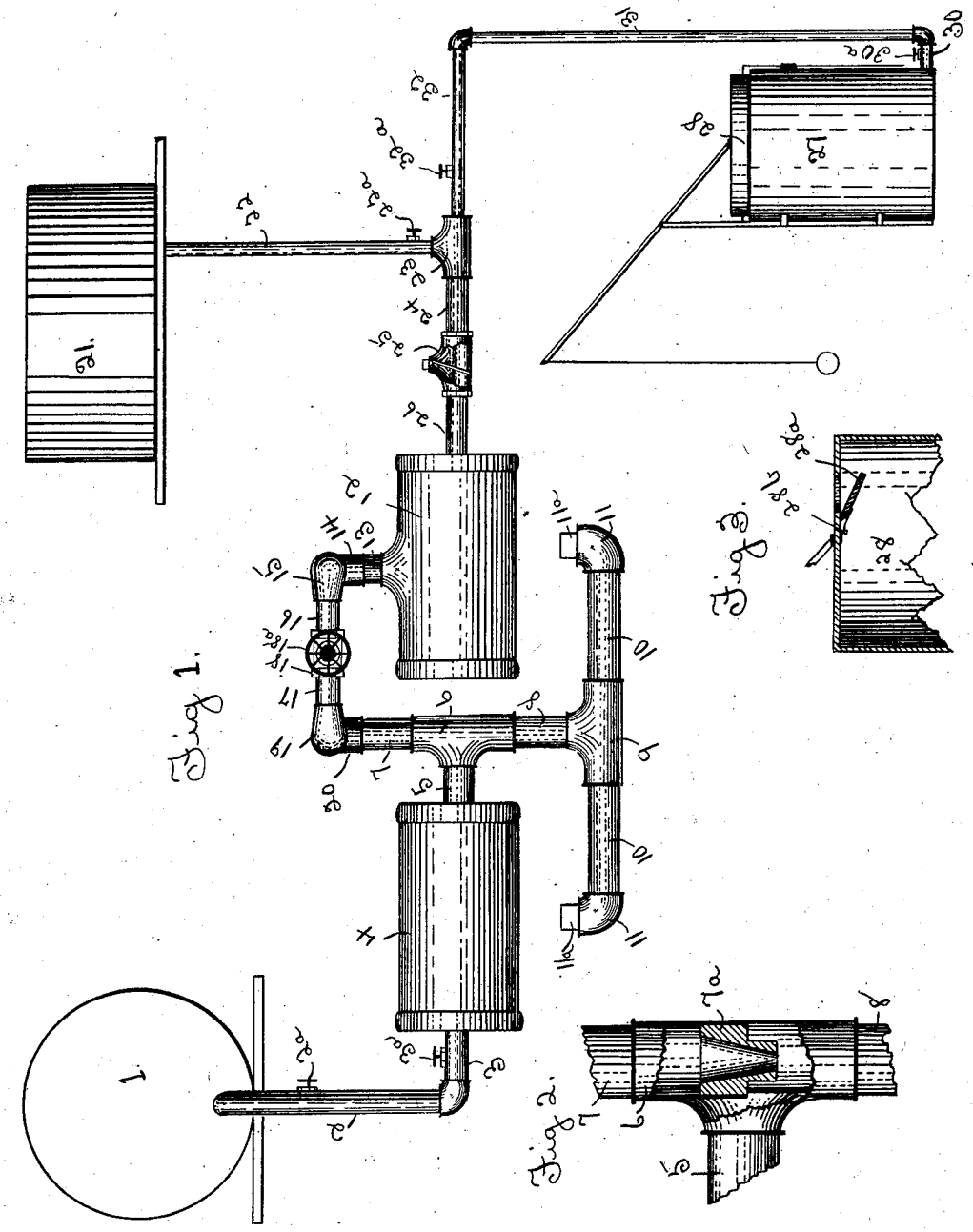
W. GHIGLIERI.

PETROLEUM GAS BURNER.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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PETROLEUM-GAS BURNER.

SPECIFICATION forming part of Letters Patent No. 744,528, dated November 17, 1903.

Application filed December 8, 1902. Serial No. 134,390. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GHIGLIERI, a citizen of the United States, residing at Stockton, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Petroleum-Gas Burners Adapted to the Combustion of Earth-Oils in Stoves, Furnaces, &c.; and I do 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, reference being had to the accompanying drawings, and the figures of reference thereon, which form a part of this specification.

My invention relates to burners adapted to consume petroleum and its various suitable distilled liquid products, and more particularly to that class which is applicable for use in furnaces and stoves in the place of the ordinary fuels of coal, wood, or gas, either natural or artificial.

The object of my invention is to provide an apparatus which will convert the petroleum or earth-oil into a purified gas ready for combustion as it escapes from the outlets of my improved burner. This I accomplish mainly by the use of a hollow cylinder for the reception of the oil to be consumed, and also by the use of a companion cylinder or its equivalent adapted to the reception of air or water, the contents of the cylinders being acted upon simultaneously when the burner is in operation, and by the use of the peculiar construction of parts hereinafter set forth, and particularly pointed out in the claim hereunto annexed, reference being had to the accompanying drawings for a better comprehension hereof, in which—

Figure 1 is a front elevation of my entire improved petroleum-gas-burner apparatus, showing also the sources of supply of the oil, and of the water or air. Fig. 2 is an enlarged detached view, partly in section, of the section of the burner where the vapors produced from the oil and the air or steam come in contact and are mingled and the product converted into gas ready for combustion. Fig. 3 is a side sectional view of an air-tank, showing the valve adapted to admit air into the tank or air-receptacle.

Similar numerals indicate corresponding parts in the several views.

A tank 1 is the supply source of the petroleum or other suitable oil and has attached thereto a vertical pipe 2, having near its connection with the tank a stop-cock 2^a, controlling the flow of the oil. The pipe 2 in turn is connected with a horizontal pipe 3, having a stop-cock 3^a, which is located immediately outside the stove or furnace and controls the flow of the oil into a hollow cylinder or generator 4, horizontally located, at which point the action of the fire after the cylinder is thoroughly heated, as will be shown, from its outside causes vaporization of the oil. From the cylinder 4 the vapor passes into and through a horizontal pipe 5 into a vertical T-joint 6, where it is joined by and mingled with steam or air from a horizontal cylinder or generator 12, which is connected with the T-joint 6 by a series of suitable pipes and elbow-joints—to wit, an upright pipe 13, discharging into an elbow 14, which in turn discharges into a horizontal pipe (not seen in the drawings) and which connects with an elbow-joint 15, with which joint is connected a horizontal pipe 16 at right angles and which discharges through a valve 18, provided with a shut-off 18^a, into a similar horizontal pipe 17, which in turn discharges into an elbow-joint 19, into and through a pipe (not seen in the drawings) into an elbow-joint 20, thence into a pipe 7, which discharges into the T-joint 6, which discharges into a vertical pipe 8, thence into a horizontal T-joint 9, to which are attached horizontal arms 10, provided with elbows 11, having perforated plugs or burner-tips 11^a at their apexes. The pipe 7 is provided with a plug 7^a, which has a funnel-shaped orifice therein and its lower end located on a level with the bottom of the outlet end of the pipe 5.

I will now describe the means and method by which I supply air or water to the cylinder 12. I have illustrated the apparatus for supplying both air and water. The water may be supplied from any fixed system either by pressure or gravity; but I have selected a

tank 21, which must be located so as to permit the water by the force of gravity to flow downward through a vertical pipe 22, the flow of water being controlled by a stop-cock 22^a into a horizontal pipe 24, provided with an automatic check-valve 25 for the purpose, as will be hereinafter shown, into a horizontal pipe 26 and from thence into the cylinder 12. The air-supply apparatus consists of an ordinary compressed-air tank composed of the outer section 27 and the inner section 28, which has a cover provided with a valve 28^a, the position of which is controlled by a spring 28^b. A horizontal pipe 30, provided with a stop-cock 30^a, discharges into a vertical pipe 31, which in turn discharges into a horizontal pipe 32, provided with a stop-cock 32^a, which pipe 32 connects with a T-joint 23 at right angles to the water-supply pipe 22, which also connects with and discharges into the joint 23.

The mode of operating my device is in exact detail as follows: The oil intended for combustion flows down the series of pipes heretofore described and enters the cylinder 4, which by reason of having been previously properly heated by any suitable initial fire causes the oil to vaporize. The vapor then passes from the cylinder 4 through the pipe 5 into the T-joint 6, where it is met by the steam or air as it flows through the funnel-shaped orifice of the plug 7^a, and by reason of the commingling of the oil-vapor with the steam or air the consequent chemical action produces clear gas, which finds vent through the series of pipes, &c., connected to the T-joint 6, and as it escapes from the burner-tips 11^a is consumed. When steam alone is used, the air is shut off by means of the stop-cock 32^a in the pipe 32. When air alone is used, the water is shut off by the stop-cock 22^a in the pipe 22. The check-valve 25 automatically regulatesthe flow of the water into the cylinder 12, as when there is sufficient steam the consequent back pressure closes the valve, and when the amount of steam decreases the valve is opened by the force of the inward-flowing water. The water as it enters the cylinder 12 is converted into steam by the flame from the burner-tip 11^a, located directly beneath the cylinder 12. The steam passes from the cylinder 12 through the series of pipes, &c., heretofore described, its flow being regulated by the shut-off 18^a of the valve 18 and mixes with the oil-vapor from the cylinder 4, as heretofore shown, at the end of the funnel-shaped outlet of the plug 7^a.

The elbow 11, holding the burner-tips 11^a, may be affixed to the ends of the pipes 10 in a position so as to deflect the flame away from the cylinder and the flame caused to strike upon a lining of fire-brick of a casing which may be attached to the cylinders or at any desirable point adapted to the configuration of the stove or furnace.

In place of the cylinder 12 a series of tubes or a coil of pipes may be used. The cylinder 12 may also be provided with a water-gage if desired.

The valve 28^a of the air-tank 28 is adapted to admit the air when the tank is elevated for the purpose of receiving a charge of air.

The stem of the shut-off 18^a will be constructed of sufficient length so that the handle end (illustrated by a wheel) will be outside the stove or furnace and within easy reach and out of the range of extreme heat.

By shutting off the supply of oil and turning on the water when the cylinder 12 is quite hot the rush of steam will cleanse the inside of the burning apparatus proper from all deposits or accumulations resulting from the use of oil.

Wherever the word "pipe" occurs it implies an iron tube.

The series of tubes, &c., connecting the cylinder 12 to the T-joint 6 may be dispensed with in burners of small proportions, and in lieu thereof the T-joint 6 may be inverted, so that its two ends will be connected directly with and enter the respective cylinders and its stem be connected to and discharge into the tube 8. The plug 7^a then will occupy a relative position between the outlet of the cylinder 12 and the outlet of the T-joint 6 with similar functions as it does in its position as shown by the drawings.

I have entered into a detailed description of the construction and relative arrangement of parts embraced in the present and preferred embodiment of my invention in order to impart a full, clear, and exact understanding of the same. I do not desire, however, to be understood as confining myself to such specific construction and arrangement of parts, as such changes or modifications may be made in practice as fairly fall within the scope of my claim. I also do not desire to be understood as confining myself to the use of the mechanism described and illustrated in connection with the air and water supply, as my invention may be used in other connections to which it is applicable.

Having described my invention, what I claim is—

In a hydrocarbon-burner, the combination of cylindrical generators 4 and 12, arranged end to end, burners disposed below the said generators, a conduit connecting the generator 12 and the burners, and extending between the adjacent ends of the generators, a valve in said conduit, a conduit interposed between the generator 4 and the first-mentioned conduit at a point below the valve in the latter, a source of oil-supply, a valved conduit connecting said source of supply and the generator 4, a source of water-supply, a conduit connecting the source of water-supply and the generator 12, a check-valve in the latter conduit, arranged to open toward the

said generator, a source of compressed-air supply, and a valved conduit leading from the compressed-air source of supply to the conduit between the water-supply and the generator, 12, at a point at the opposite side of the check-valve with reference to said generator 12.

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

WILLIAM GHIGLIERI.

Witnesses:
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