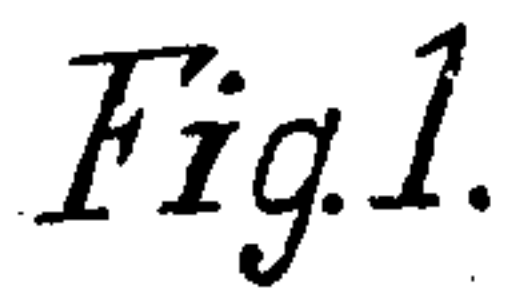


APPLICATION FILED MAY 28, 1906.

913,288.

Patented Feb. 23, 1909.
2 SHEETS—SHEET 1.



Witnesses.
Dr. Adolph Zimmermann
Ed. Lauterbach

Inventor.
Sam. H. Richmond

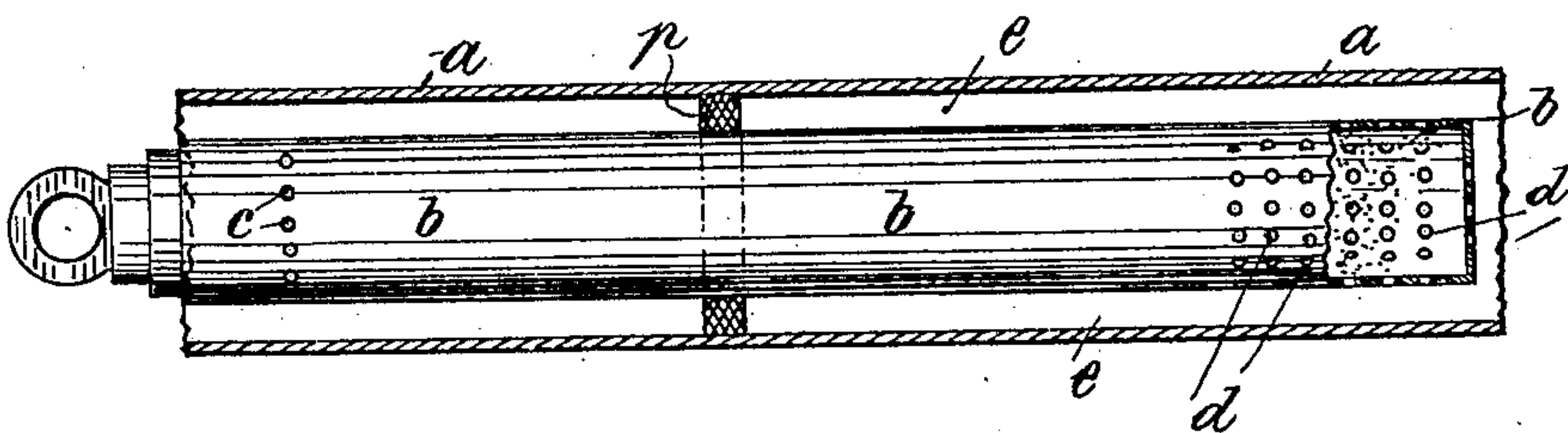
C. HEINRICHSORFF.
VAPORIZER FOR BURNERS.
APPLICATION FILED MAY 28, 1908.

913,288.

Patented Feb. 23, 1909.

2 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
H. L. Robbins.
A. C. Raligan

Inventor:
Curt Heinrichsdorff
by Wright & Brown, Attorneys
May 11, 1909

UNITED STATES PATENT OFFICE.

CURT HEINRICHSORFF, OF BERLIN, GERMANY.

VAPORIZER FOR BURNERS.

No. 913,288.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed May 28, 1906. Serial No. 319,042.

To all whom it may concern:

Be it known that I, CURT HEINRICHSORFF, a merchant and a subject of the German Emperor, and a resident of 19 Puttkamerstrasse, in the city of Berlin, Kingdom of Prussia and German Empire, have invented certain new and useful Improvements in Vaporizers for Burners, of which the following is a specification.

10 This invention has reference to improvements relating to the so-called vaporizer or gasifier, provided in heating and lighting devices, fed with liquid fuel, such as lamps, stoves, ranges and the like, where the liquid
15 fuel is evaporated and converted into vapors or gas in a vessel, tube or the like, heated by external heat, the vapors or gas thus produced being then burned like ordinary fuel gas.

20 My invention is intended to avoid the inconveniences, usually met with in devices of this kind, of the passages and escape orifices of the fuel frequently becoming choked up by the depositing and the
25 carrying along of solid residues which are either present in the fuel itself or which are formed during the process of combustion and evaporation of the same; and it also does away with the excessive heating of the metal
30 parts of the evaporating or gasifying vessel and its connections and it prevents the flickering and sudden flashing of the flame of the lamp, stove or the like, fed with the gaseous product, which is due to the above
35 mentioned causes and to irregular superheating of the fuel in the gasifying or vaporizing process.

The fuel in my invention, as in other vaporizing devices, is allowed to pass
40 during the vapor-forming process through a layer of solid distributing material and heated by the action of a suitable source of heat. The said material may possess a filtering action and is either in granulated
45 condition or of a more fibrous, yet loose structure which will not prevent the passage of the liquid and will either not absorb the same at all or at least to a very slight extent only, and by this means the deposits
50 formed by the heating or superheating process are retained and the liquid fuel on the other hand is so finely and uniformly distributed within the distributing material and at the outside of the same, that the
55 evaporation and gasification or superheating of the fuel for the purpose of the formation

of gas or vapors does not present any difficulties and takes place in a perfectly uniform and not in an irregular manner.

In my invention it is not necessary to provide means for cooling the evaporation-
60 effecting part of the distributing material, as has been the case in a great many vaporizers or gasifiers heretofore in use, the evaporation-effecting part of the device being sur-
65 rounded in my invention in all its parts by a layer of liquid or of vapors and of gas respectively and in view of this fact, in my invention the flame or source of external heat, which is intended to produce the vapor or
70 the combustible gas, may be allowed to act uniformly on all parts of the distributor, whereby both the evaporation and the gasification are facilitated, without allowing the superheating effect of the walls of the gasifier
75 or vaporizer to cause undesired decomposition of the vapors and without the possibility of producing the above mentioned inconveniences of the flickering of the flame of the lamp, stove or the like and of the precipita-
80 tion of injurious impurities or residues, after the fuel has passed through the distributing and filtering material and in the passages and escape orifices of the vaporizer. I am aware that vapor heating jackets in combi-
85 nation with vaporizing inner tubes, containing a distributing or filtering material, are not broadly new, but in the devices heretofore employed, the decomposition-mitigating effect of the layer of liquid fuel at the en-
90 trance end of the vaporizer was not known, so that decomposition took place at the walls of the vaporizing tube, which is avoided in my invention.

In the accompanying drawings I have
95 shown an evaporator or superheater for liquid fuel embodying my invention, in which,

Figure 1 represents one form of such device, and Fig. 2 represents a modified construction.
100

The device is essentially composed of two parallel tubes of any suitable length, an outer tube *a* and an interior tube *b*. The device is mounted in the manner, well-
105 known in gasifiers or vaporizers of this kind in the fuel admitting conduit at some point between the storage receptacle for the liquid fuel and the burner, so as to constitute part of the fuel-conduit. The loose and prefer-
110 ably coarse, granular distributing material, such as sand or the like, is placed at the in-

terior of the inner tube *b* which is closed at one end, while the other end is open and may be closed and opened by a threaded stopper *g* or in any other suitable manner, in order to be able to fill the said tube with the distributing and filtering material and to empty the same for the purpose of cleaning the tube or of renewing and exchanging the filling material. Provision is made to allow the liquid fuel to enter into the filtering or distributing material at one end of the inner distributing or filtering tube *b*, the liquid then passing through the tube in an axial direction and being discharged at the other end in a heated and already purified condition and in the gaseous state and in the most suitable condition for superheating the same. The superheating takes place preferably by the same source of external heat which is used for heating the external tube *a* and for heating and converting into vapor the liquid fuel entering at the entrance end of the device into the inner tube *b*. This heating of the fuel and superheating of the vaporized or already heated fuel by the application of a flame or other source of external heat, takes place largely at the interior of the distributing or filtering material and to a large extent before the vapor leaves the inner tube through the openings *d* provided at that end of the tube for the escape of the fuel after its passage through the distributing or filtering material at the inside of the tube. The openings *c* in the wall of the inner tube serve for the admission of the liquid fuel in the preferred form of construction shown in the drawings. Thus the filtering or distributing inner tube is surrounded at the admission end by a thin layer of liquid, while at the escape end it is surrounded by a thin layer of gas or of vapors, by which means the external flame is prevented from acting directly upon the distributing or filtering tube and I thereby also avoid the difficulty of heating the parts of the liquid at the walls of the distributing and filtering tube considerably higher than the rest of the liquid and of even carbonizing the liquid, as it frequently occurs with the devices of this kind which are based on the direct action of the flame.

In order to separate those parts of the distributing or filtering tube which serve for the admission of the liquid fuel, from those parts which serve for the escape of the liquid, any suitable means may be employed, for instance a ring or the like, such as the ring *p* shown in Fig. 2, between the distributing or filtering tube *b* and the exterior tube *a* which latter is exposed to the direct action of the source of external heat, of a flame for instance, and which surrounds the distributing or filtering tube *b* at a certain distance therefrom. In the form of construction, shown by way of example in Fig. 1 of the drawing, the separation of these two parts is effected by making

the diameter of the admission part of the distributing or filtering tube larger than that of the other part of the same and providing the place of separation with a conical shoulder. The outer tube *a* is also provided with a corresponding conical shoulder at its inside at *f*. Both tubes are fitted upon each other, so that the conical parts will touch each other. The diameters of the tubes are so arranged, that a free space *e* is left between the walls of the two tubes. The admission of liquid fuel may take place at one end of the tube *a* while the escape of the gas or vapors produced will take place at the other end.

The herein described means of separating the admission part from the gas space or gas chamber presents an additional advantage in that the wall of that part of the distributing or filtering tube which constitute the superheater or gasifying space, is placed at a greater distance from the direct action of the flame, so as to prevent the injurious heating of the filtering and distributing material that might cause it to adhere to the walls of the tube and the carbonizing of the fuel in a far more efficient manner, than it is possible to obtain with equal diameters of both parts of the distributing or filtering tube. The gas or vapors produced from the liquid fuel in the part *b* are then conducted to the burner and burned in the ordinary manner.

The gasifying or vaporizing tube hereinbefore described may be placed in the fuel conduit in a vertical as well as in a horizontal or in an inclined position, depending on the particular construction of lighting or heating device for which the said tube is to be employed.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A vaporizing and gasifying device for liquid fuel, comprising inner and outer substantially cylindrical casings, the inner one having perforations and containing packing material and adapted to permit a continuous flow of fuel in the direction of its length, the outer casing surrounding the inner casing, and providing around the latter a narrow, annular, free space adapted to receive liquid fuel and prevent the undue heating of the inner casing and carbonizing of the fuel by an external source of heat, said outer casing being adapted to be externally heated, and means for admitting liquid fuel into said inner casing.

2. A vaporizing and gasifying device for liquid fuel, comprising an inner and an outer casing separated by an annular space which is open at the ends of the outer casing, the inner casing containing a quantity of material for distributing liquid within it and having admission and discharge openings in its walls, and means for causing liquid fuel entering said annular space to flow into and through said inner casing and filtering mate-

rial by way of said admission and discharge openings.

3. A vaporizing and gasifying device for liquid fuel, comprising an inner and an outer casing separated by an annular space which is open at the ends to admit the liquid fuel and to discharge the gas formed from the fuel by the application of heat to the outer casing, inlet and outlet openings in the inner casing adjacent the ends thereof, and a shoulder intermediate the inlet and outlet openings obstructing the annular space, the inner casing being of greater diameter on the inlet side of said shoulder than is the portion between said shoulder and the outlet openings.

4. A vaporizing and gasifying device for liquid fuel, comprising an inner casing closed at one end and provided with perforations in its walls near the ends, containing granular material for distributing liquid within said casing, an outer casing open at its ends surrounding the inner casing and separated by a space from the same, and an obstruction preventing longitudinal flow of fuel between the casings and causing it to pass through the granular material in the inner casing.

5. A vaporizing and gasifying device for liquid fuel, comprising an inner casing closed

at one end and provided with perforations in its walls near the ends, containing granular filtering material, an outer casing open at its ends surrounding the inner casing and separated by a space from the same, an internal shoulder on the outer casing, and an external shoulder on the inner casing cooperating with said internal shoulder to close the space between the casings at a point intermediate the ends thereof, whereby the liquid fuel entering one end of the outer casing is caused to pass through and out from the inner casing, being purified therein by the filtering material and gasified by an external source of heat acting on the outer casing.

6. A vaporizing and gasifying device for liquid fuel, comprising a casing having means within it for distributing liquid fuel supplied thereto, and means for enveloping a portion of said casing with a thin layer of liquid and another portion with a thin layer of vapor.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CURT HEINRICHS DORFF.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.