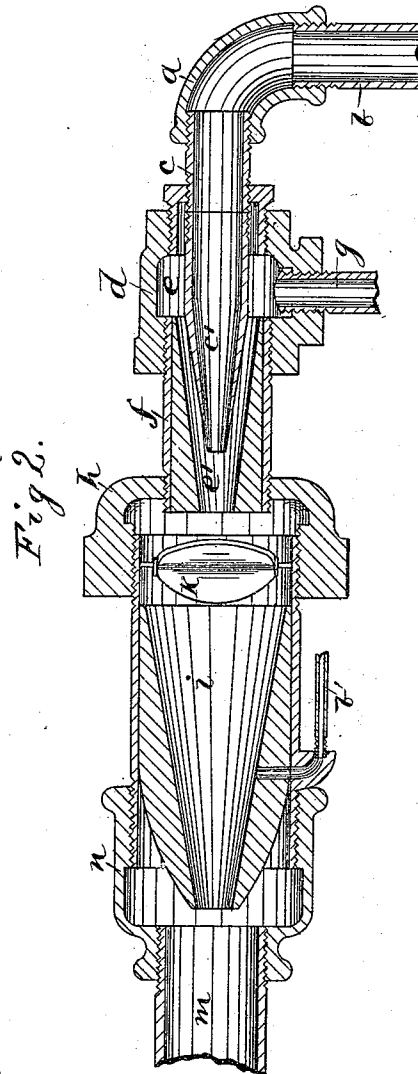
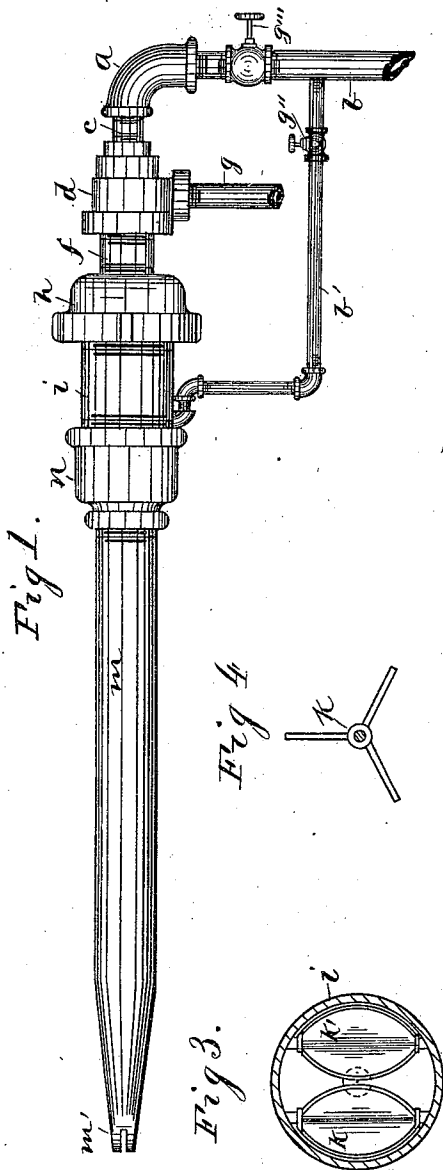


(No Model.)

W. F. KARCH.
HYDROCARBON BURNER.

No. 553,915.

Patented Feb. 4, 1896.



WITNESSES:

Lester L. Allen:
A. M^c Cartz.

W. F. Karch, INVENTOR
BY
R. J. M^c Cartz, ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM F. KARCH, OF DAYTON, OHIO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 553,915, dated February 4, 1896.

Application filed October 5, 1894. Serial No. 524,988. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. KARCH, of Dayton, county of Montgomery, State of Ohio, have invented a new and useful Improvement in Hydrocarbon-Burners; 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 to the letters of reference marked thereon, which form a part of this specification.

My invention relates to useful improvements in hydrocarbon-burners; and it consists in means for vaporizing crude oil, such as petroleum, to the end that a thorough combustion is obtained and the oil transformed in the burner into a vapor. A common defect met with in crude-oil burners is a failure to thoroughly vaporize the oil before it reaches the point of ignition, which results in a constant dripping of the oil from the burner-tip on the grate-bars and into the ash-pit.

The object, therefore, of this invention is to reduce the oil to a vapor or gas which readily ignites when it comes in contact with the hot air under the boiler, without any attending waste or accumulation of oil on the grate-bars or in the ash-pit.

To this end my improvements have reference to parts that will be fully described in the specification, and set out in the claims.

Referring to the annexed drawings, forming a part of the specification, Figure 1 is a side elevation of my improved crude-oil vapor-generator and burner; Fig. 2, a central longitudinal section of the same with part of the burner broken off; Fig. 3, a transverse section of the vapor or gas chamber, showing the atomizing or vaporizing fans; Fig. 4, a detached detail view of one of the fans, showing the angle of the vanes.

In the detailed description to follow, similar letters of reference indicate corresponding parts in the several views.

a designates an elbow-fitting into which a steam-induction pipe *b* and a steam-induction cone *c* are fitted.

d is a pipe-fitting having an oil-chamber *e*, and *f* designates a coupling connected with said fitting *d*. This coupling has a cone-

shaped oil-run *e'* that registers with the oil-chamber *e* and through which the oil is drawn by suction created by the steam passing through the chamber *c'* of the cone *c*. The steam-cone *c* occupies a horizontal and central position in the oil-chamber *e* and projects into the outer cone *f*, thereby decreasing the annular space forming the oil-run *e'*.

g designates an oil-induction pipe that enters the oil-chamber *e* and which is controlled by a globe-valve *g'*.

h is a reducing-coupling connecting the oil and steam chambers *e'* and *c'* with the conical-shaped vapor or gas generating chamber *i*.

k and *k'* designate metallic fans having their shafts journaled in the piping at the entrance to the gas-chamber *i*. These fans are preferably constructed of brass or bronze and have each three vanes arranged on equal angles, as shown in Fig. 4, and lie directly in the path of the oil and steam as said elements leave the oil-run *e'* and steam-passage *c'*.

The conical shape of the gas-chamber *i* directs the oil in an atomized or vaporous form to the burner *m*, which is connected to said chamber *i* by a reducing-coupling *n*. The burner-tip *m'* passes through the boiler front. (Not shown.)

In order that the fans may not be affected by the steam when the burner is not in use and to provide means for keeping said burner free from accumulations that might clog it up, I run an auxiliary steam-pipe *b'* from pipe *b* into the gas-chamber *i*, both pipes being controlled by globe-valves *g''* and *g'''*, it being understood that steam is only permitted to pass through said auxiliary pipe when the oil and steam are cut off in pipes *g* and *b*. The steam is ordinary boiler-pressure, and the oil placed in an elevated tank will have sufficient gravity or it may be subjected to pump-pressure. As the steam enters the conical-shaped oil-run *e'* a strong suction is created which draws forth the oil, forcing it through the small end of said conical-shaped chamber against the fans, which are driven thereby at a great speed, and said oil thereby becomes thoroughly atomized or vaporized and is delivered to the generating chamber *i*, where it obtains volume and is forced by the steam through the burner un-

der the boiler and is speedily ignited and burns a white flame.

The dotted lines in Fig. 3 show the relative size of the opening through which the steam and oil pass to the atomizers or fans, and from which it will be seen the force of said steam is concentrated on the widest portion of the fan-vanes, which rapidly revolves both fans.

I am aware that it is not new to place a fan or distributing-blades in a burner of the class herein named. Therefore I do not desire to claim such in a broad sense.

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

1. In a hydrocarbon-burner, the combination with the oil and steam induction pipes *g* and *b*, of a pipe-fitting *d* provided with an oil-chamber *e*, a steam-induction cone *c* projecting through said oil-chamber, a coupling *f* provided with a conical chamber *e'* into which the cone *c* projects, and through which the oil passes, a plug provided with a conical vapor-chamber *i* of an increased area, and two sets of atomizing blades or fans each set being independently mounted in the mouth of the chamber *i* adjacent to the front end of the oil and steam chamber *e'*, whereby means are provided for thoroughly atomizing a

maximum quantity of oil, substantially as described.

2. In a hydrocarbon-burner, the combination with oil and steam induction pipes *g* and *b*, of a pipe-fitting *d* provided with an oil-chamber *e*, a steam-induction cone *c* projecting through said oil-chamber, a coupling *f* provided with a conical chamber *e'* into which the cone *c* projects, and through which the oil passes, a plug provided with an enlarged conical vapor-chamber *i*, and two series of atomizing-fans *k* and *k'* in the mouth of said chamber *i*, said fans being adapted in the direction of the passage of the vapor to the chamber *i*, an auxiliary steam-pipe *b'* connected to the pipe *b* and communicating with the chamber *i* at a point in advance of the atomizing-fans, whereby means are provided for generating a maximum quantity of vapor, and for introducing steam into the burner for the purpose of cleansing, without actuating the fans, substantially as described.

In testimony whereof I have hereunto set my hand this 26th day of September, 1894.

WILLIAM F. KARCH.

Witnesses:

GEORGE H. WOOD,
R. J. McCARTY.