

(No Model.)

G. BOTSFORD.

HYDROCARBON OIL VAPORIZER AND BURNER.

No. 486,026.

Patented Nov. 8, 1892.

Fig. 1

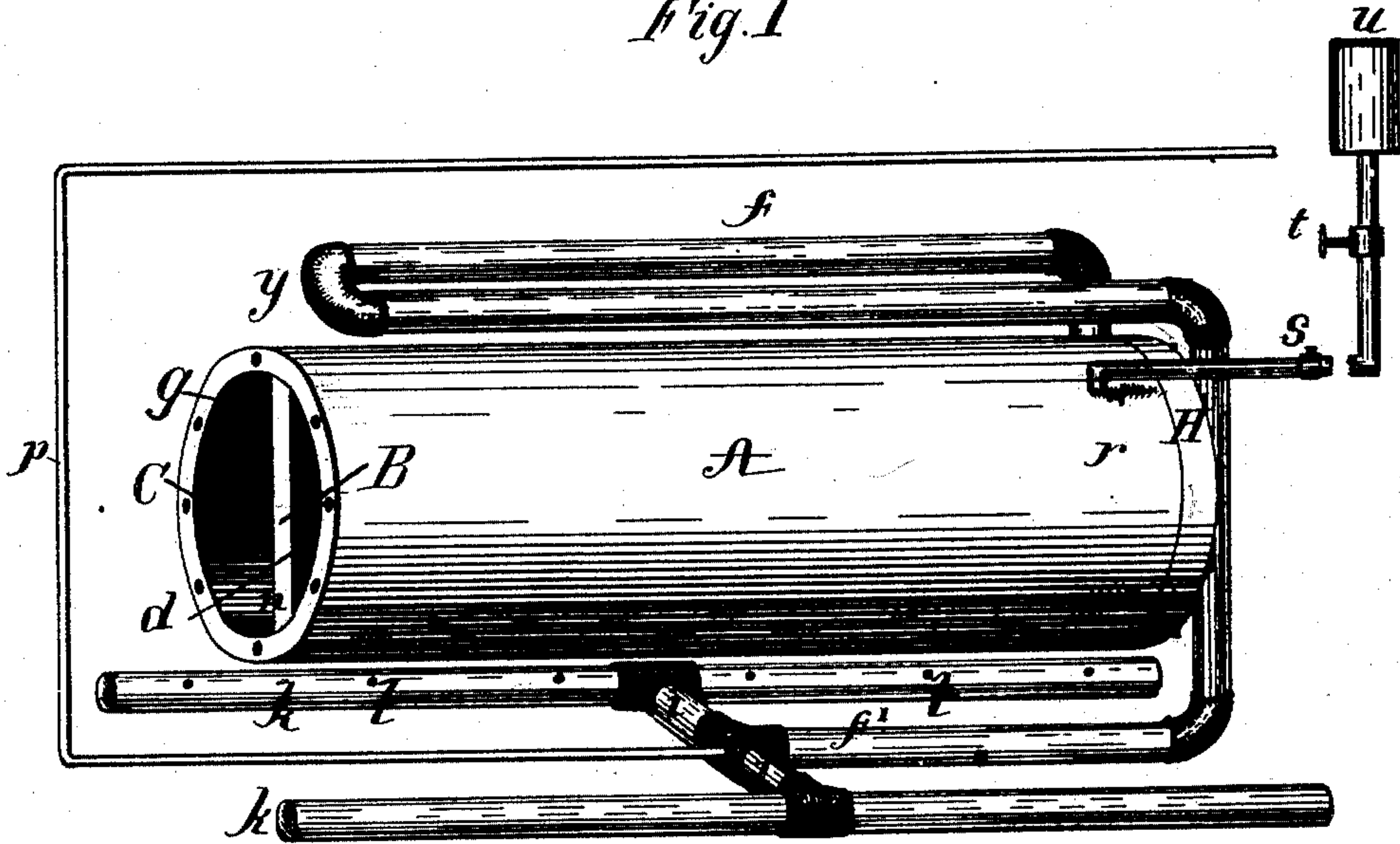


Fig. 2

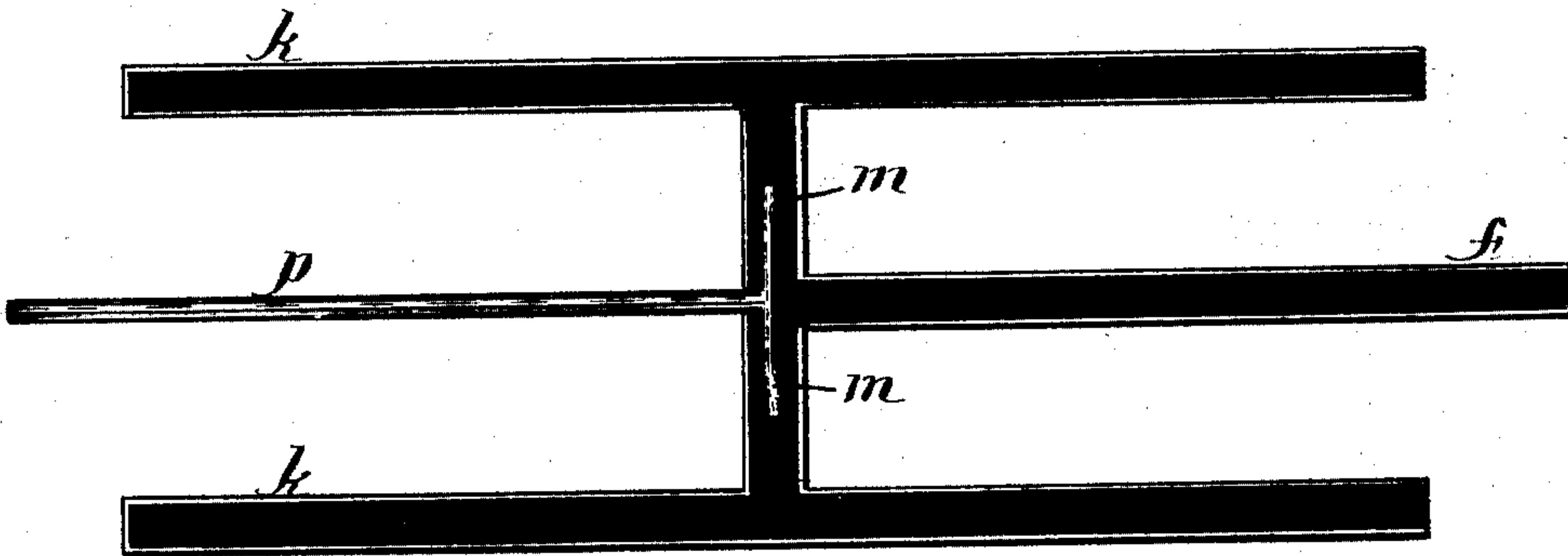


Fig. 4

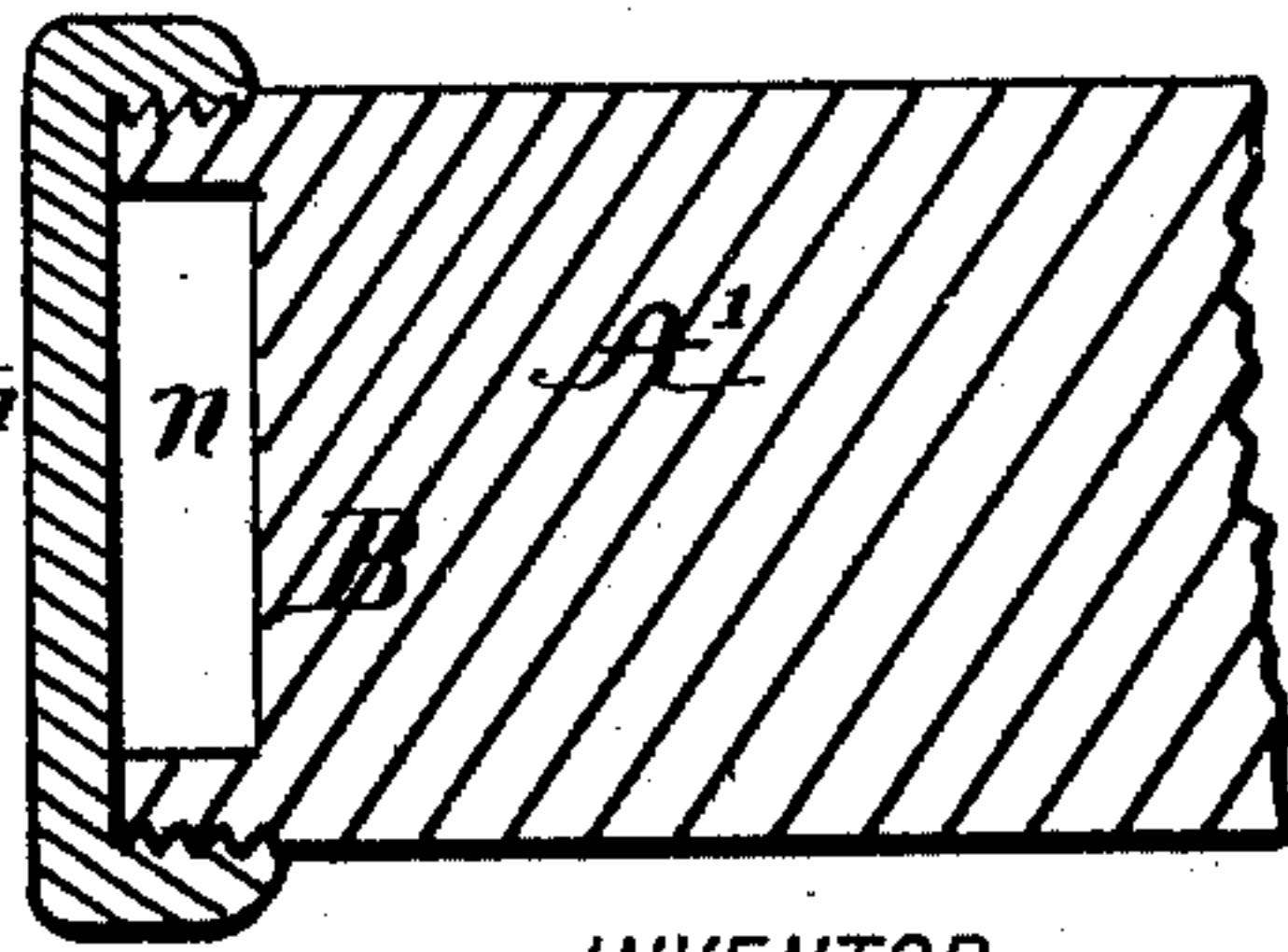
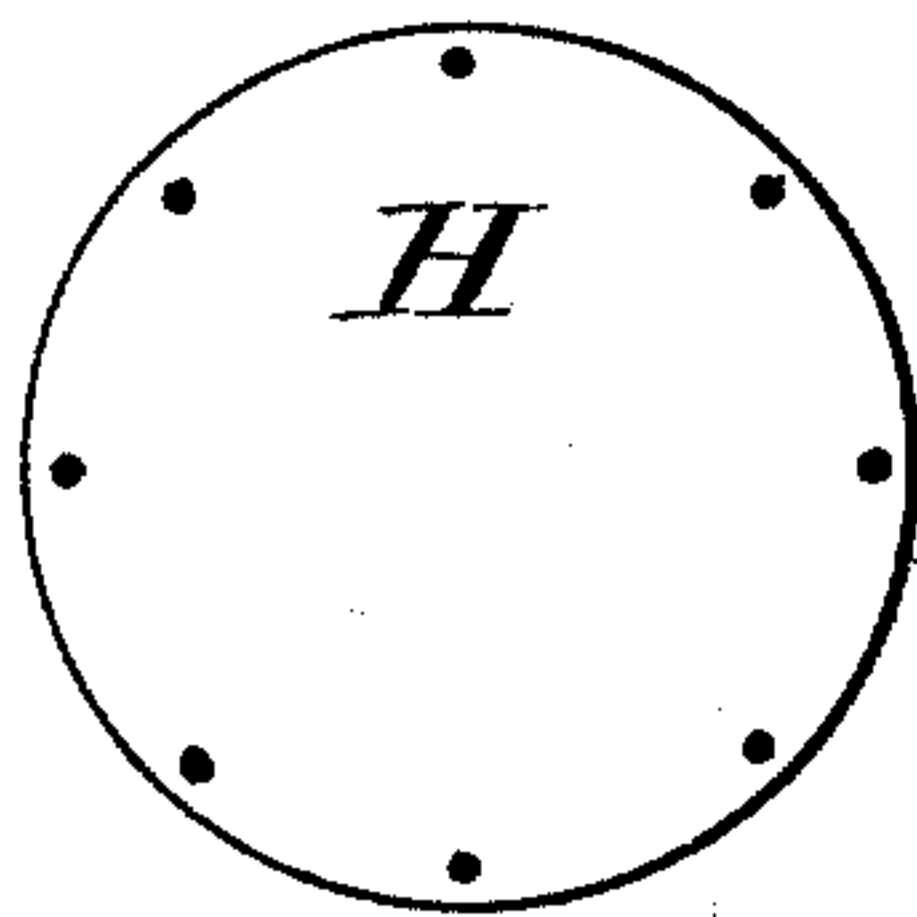


Fig. 3



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HYDROCARBON-OIL VAPORIZER AND BURNER.

SPECIFICATION forming part of Letters Patent No. 486,026, dated November 8, 1892.

Application filed March 25, 1892. Serial No. 426,331. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BOTSFORD, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Hydrocarbon Oil Vaporizers and Burners, of which the following is a specification.

The object of my invention is to provide a hydrocarbon-oil vaporizer and burner of simple, strong, and durable design, and which shall be adapted for ready access to the interior of the vaporizing-retort to remove carbon deposits therein.

The invention consists in the novel construction, arrangement, and combination of the parts of the burner, as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a perspective view of my improved oil vaporizer and burner with the retort-head removed to show the interior. Fig. 2 is a horizontal section through the burner-pipes, showing the method of combining the steam and vapor. Fig. 3 is a view of the retort-head. Fig. 4 is a vertical section of a modification.

Referring to the drawings, A designates the retort for vaporizing the oil, which is a cylindrical shell having its ends closed by suitable heads H, bolted thereon, and provided with a wall or vertical partition B, extending lengthwise centrally throughout the shell, preferably cast integral with the upper and lower sides thereof and terminating within a short distance of the back end C of the retort, thus dividing the retort into two compartments *d* and *g*, connected by a space or channel *n* at the back end C, between the head and the end of the partition B.

The oil to be vaporized, which comprises the various grades of crude petroleum, is admitted into the chamber *d* at the front end *r* of the retort at the upper side thereof, having the usual check-valves *s* and stop-cock *t*, and connected with an oil supply or reservoir *u*, as shown. A vapor-pipe *f* leads from the compartment *g* at the front end and upper side thereof, and is extended lengthwise over the retort one or more times to form a superheating-coil *y*. Thence passing down at the end of the retort it is led along centrally under

the shell in a horizontal extension *f'* to a point about midway thereof, where it is connected by branch pipes *i* with a pair of parallel burner-pipes *k*, having the perforations *l*, through which the vapor escapes in flame-jets after ignition. A sufficient number of the said perforations are adapted to direct flame against the lower sides of the retort, thereby heating the oil therein and maintaining constant vaporization of the contents thereof after the apparatus is first set into operation by means of initial heat and flame introduced beneath the retort. The remainder of the perforations may direct the flame as required in the stove or furnace where the apparatus is applied.

This vaporizing apparatus being intended largely for use in the furnaces of steam-boilers, a jet of steam may be introduced into the vapor-pipes from a small steam-pipe *p*, inserted through the T, which connects the vapor-pipe with the branch pipes *i*, the steam-pipe terminating in suitable nozzles *m*, placed lengthwise within the said branch pipes *i*, opening toward the burner-pipes. The steam-jets thus projected through the pipes produce a powerful exhaustion in the vapor-pipe, thereby increasing the velocity of the flow of the vapor and combining the vapor and steam in the most effectual manner. The commingling of steam with the hydrocarbon-vapor intensifies the combustion and increases the heating efficiency. The advantage of this peculiar construction is that the retort is of very strong and simple construction, and by removing the heads H the interior of the retort may be easily and perfectly cleaned of the coke or carbon deposit which invariably collects in the retorts of hydrocarbon-oil vaporizers. The oil being introduced at one end of the retort circulates twice throughout the entire length of the retort, around the end of the partition B, and is thus thoroughly vaporized, the vapor being given sufficient time to separate perfectly from the oil previous to escaping into the superheating-pipe *f*.

The apparatus is adapted to use the most common form or grade of hydrocarbon or crude petroleum oils.

Where the apparatus is intended for use in situations where steam is not available, the pipe *p* and nozzles *m* will be dispensed with,

it being understood that the apparatus will operate without the combination of a steam-jet with the vapor, and in connection with steam-furnaces the steam-jet is not available until after a supply of steam has been first generated in the boiler. In some cases a single burner-pipe beneath the retort will be sufficient, similar to the extension f' shown, which would then contain the perforations l and extend the entire length of the retort, as desired. The combination of the steam siphon-nozzles with the vapor-pipe insures perfect commingling of the steam and vapor and produces strong and steady flame-jets from the orifices l of the burner-pipes.

The apparatus may be mounted, as required, upon suitable legs or standards (not shown) or otherwise adapted to conform to the particular furnace or use for which it is intended. Fig. 4 shows a modification in which the end of the retort A' is threaded and the inter-

nally-threaded head H' is screwed thereon like an ordinary nut.

I claim as my invention—

In a hydrocarbon-oil vaporizer and burner, the combination of the tubular retort or shell provided with the horizontal longitudinal dividing-partition, the removable heads adapted to be secured to the ends of the shell, the superheating-pipe above the retort, a burner pipe or pipes beneath the retort connected with the superheating-pipe, and a steam-pipe connected with the vapor-pipe and having a nozzle or nozzles entering therein between the burner-pipe and retort and adapted to project a steam-jet toward the burner-pipes, substantially in the manner and for the purpose specified.

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Witnesses:

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