No. 886,103. PATENTED APR. 28, 1908.

R. H. WHITE.

HYDROCARBON BURNER.

APPLICATION FILED FEB. 24, 1903.

2 SHEETS—SHEET 1.

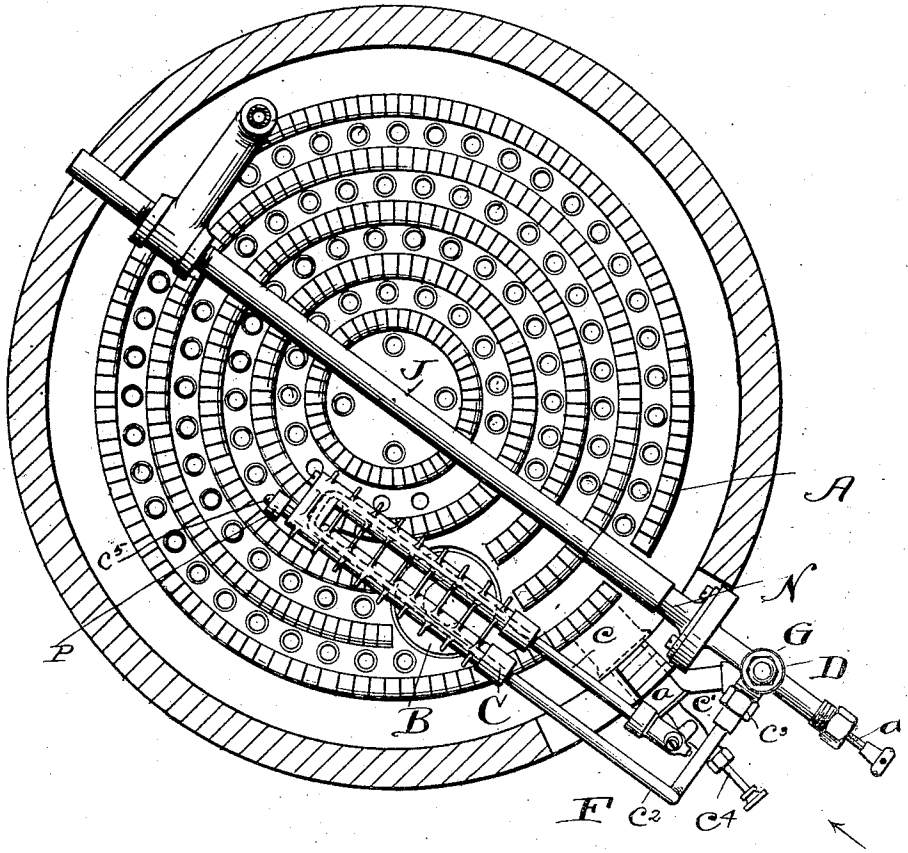


Fig. 1.

Witnesses.
E. B. Gilchrist
N. L. Freeman

Inventor:
Rollin H. White
By Thurston & Bates
his attorneys.

No. 886,103. PATENTED APR. 28, 1908.

R. H. WHITE.

HYDROCARBON BURNER.

APPLICATION FILED FEB. 24, 1903.

2 SHEETS—SHEET 2.

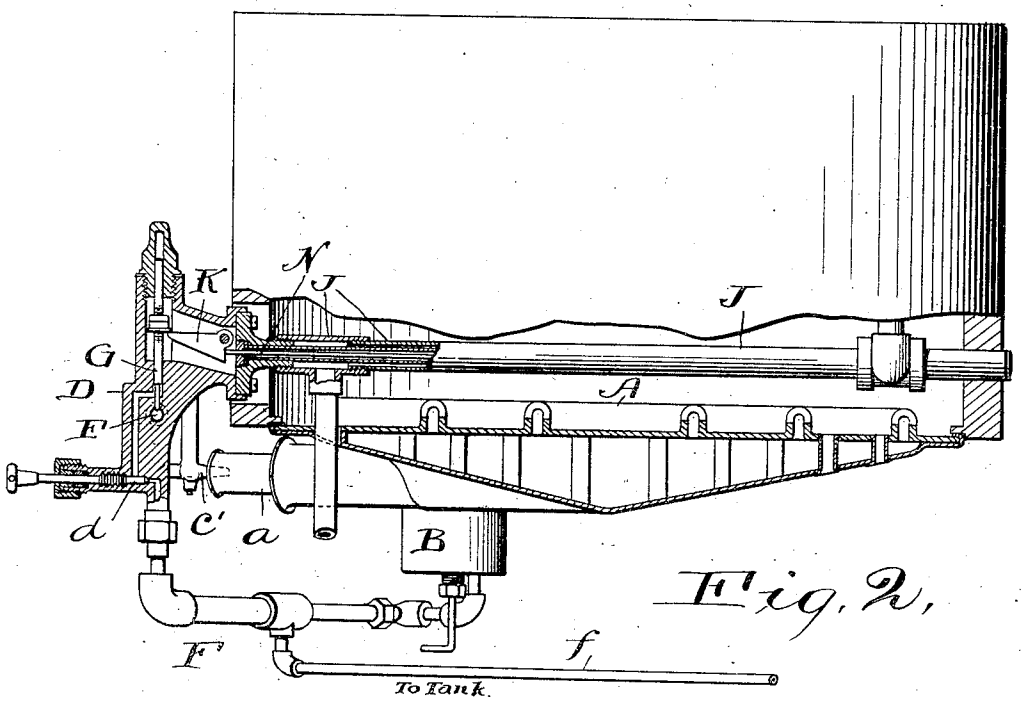
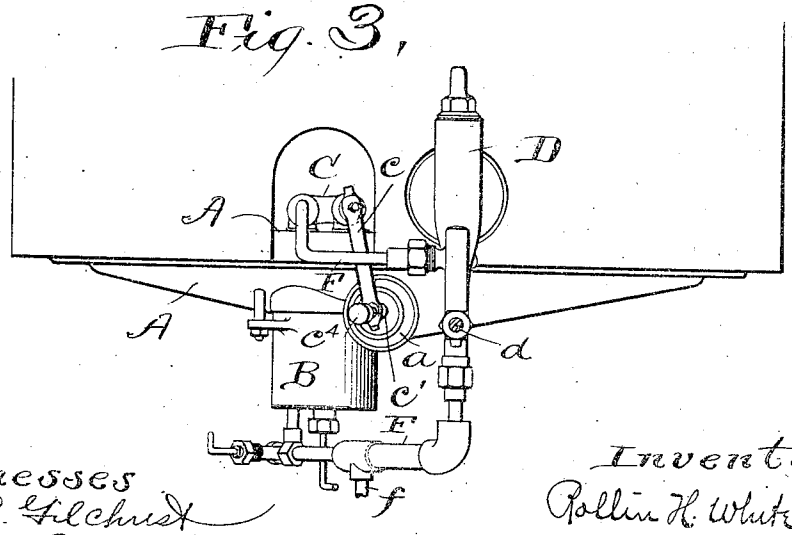


Fig. 2,

Fig. 3,



Witnesses
E. B. Gilchrist
M. L. Brennan

Inventor,
Rollin H. White
By Thurston & Bates
his attorneys

UNITED STATES PATENT OFFICE.

ROLLIN H. WHITE, OF CLEVELAND, OHIO, ASSIGNOR TO THE WHITE SEWING MACHINE COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

HYDROCARBON-BURNER.

No. 886,103. Specification of Letters Patent. Patented April 28, 1908.

Application filed February 24, 1903. Serial No. 144,557.

To all whom it may concern:

Be it known that I, ROLLIN H. WHITE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Hydrocarbon-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention is an improvement in burners adapted to vaporize a liquid and fluid to burn the resultant vapor; and it particularly relates to burners of this sort, which are used for heating the steam generators on automobiles, launches, traction engines, and the like.

In order that such burners shall be practically useful for such purposes, it is necessary to provide means for shutting off the main burner, as when the automobile is to stand immovable for a while; and means for causing the automatic lighting of said burner when it is turned on, as when it is desired to run the automobile, and means, which, under all of the conditions incident to practical use, will vaporize an adequate quantity of the fuel without any such destructive distillation of the latter as will cause carbon and other products of such destructive distillation to be deposited in said vaporizer, with the result of clogging it up and rendering inefficient to a greater or less degree.

The invention may be here summarized as consisting in the construction and combination of parts hereinafter described and definitely pointed out in the claims.

In the drawing, Figure 1 is a plan view of the burner and its associated parts; Fig. 2 is a sectional elevation of the same; and Fig. 3 is a view of the apparatus shown in Fig. 1, the view being in the direction of the arrow near said figure.

Referring to the parts by letters, A represents the main burner which may be of any suitable specific construction. The inlet to the main burner is through a mixing tube *a*, which may be of the usual form.

B represents a sub-burner or pilot light which projects up through the main burner. This sub-burner may also be of any suitable construction.

C represents a vaporizer which lies partly over the main burner and partly over the sub-burner, by which it is heated when the main burner is turned off. This vaporizer as shown in the drawing, is a casting containing a **U**-shaped passage indicated by dotted lines in Fig. 1. The outlet or discharge end of this vaporizer has a pipe *c* connected with it; and this pipe terminates in a nozzle *c'* arranged to discharge into the open end of the mixing tube *a*. The inlet end of the vaporizer is connected by a pipe F with the fuel supply tank (not shown). Connected into this feed pipe F, is a valve casing D containing the main valve *d*. This casing also contains a second valve G; and the closing of either of these valves prevents the flow of fuel through the feed pipe into the vaporizer. This valve G is an automatic valve, which, in the construction shown, is lifted from its seat by a bell crank lever K, and is moved to its seat by gravity or otherwise when the lever is allowed to move in the reverse direction. This bell crank lever is operated to lift the valve by a thermostat N which extends into the generator. The generator, which is preferably, but not necessarily, used with this burner is that which is shown in my prior patent No. 659,837; and the tube J, in which the thermostat lies, is a part of this generator.

The specific means employed for causing the automatic operation of the valve G is not at all material to the present invention. Such valves are sometimes operated by thermostats in the generator, and sometimes they are operated by mechanism which is caused to operate by the pressure of the steam in the generator. Such devices are well known in this art, and it is of no consequence to this invention what kind of automatic valve operating mechanism is employed, or whether such mechanism is caused to operate by the pressure or by the temperature of the steam. In fact, any automatic valve is not essential to the generic invention. It will be noticed that in the discharge pipe *c* of the generator there is no valve. The part marked c^4 is not a valve, but simply a movable plunger having a pointed end which is designed to be moved

periodically, if necessary, to thoroughly clean out the discharge opening in the nozzle.

The sub-burner B is connected with the fuel supply tank by the pipe F and a branch *f*, wherefore the fluid does not go through the valve casing D; and thus the shutting off of either valve *d* or G in said casing does not interfere with the flow of the fuel to said sub-burner. The sub-burner is always lighted when the automobile is fired up; and therefore the apparatus is ready for operation whenever the main burner valves are opened. Since this sub-burner is in heating relation with the vaporizer, the latter will be subjected to that heating influence at all times whether or not the main burner is turned on. If the fluid fuel were allowed to flow into this vaporizer and were held therein by some valve near its outlet end, this fuel, when so confined, would, after awhile, be heated to such a temperature by the sub-burner as would result in a destructive distillation or cracking of the oil, and the consequent deposition of carbon in the vaporizer. Very soon the vaporizer would become clogged up and practically useless. By the arrangement of parts, however, shown in the drawing, and above described, when either of the valves G or *d* are shut off, not only is the supply to the main burner cut off, but the supply of the liquid to the vaporizer is also cut off. Such oil as may be between said valve and the discharge nozzle *c'*, when said valves are closed, will be vaporized and burned, but thereafter the vaporizer will stand empty until the main burner valve is again opened. Standing thus empty the vaporizer will be heated, and so when the valves *d* and G are again opened, and the fluid fuel flows into this hot vaporizer, it will be immediately vaporized, and the vapor will flow into the main burner. As it emerges from said burner, it will be lighted by the pilot light. The heat of the main burner will thereafter maintain the necessary temperature of the vaporizer to vaporize the liquid fuel as it flows through it.

Another advantage of the construction shown is that it permits the removal of the vaporizer for the purpose of cleaning it, and its subsequent replacement. Obviously this would not be practical if the vaporizer remained filled with the combustible fluid when the main burner were turned off. The removal of the vaporizer shown requires only the unscrewing of the single coupling nut by which the vaporizer supply pipe c^2 is connected with the valve casing D. This being unscrewed the vaporizer, the nozzle *c'* and the feed pipe c^2 come out as a single piece. To replace the vaporizer one inserts the boss c^5 on the inner end of said vaporizer into a hole in a fixed support P, and then screws on the coupling nut c^3. The parts are then in readiness for use.

Having described my invention, I claim:

1. The combination of a main burner having a mixing tube, a casing above the main burner and inclosing the combustion chamber, a sub-burner which extends up through the main burner, a vaporizer removably supported within said combustion chamber and extending over the sub-burner and over a part of the main burner, and a support for said vaporizer within the combustion chamber, with a feed pipe, a valve casing secured to said feed pipe, a vaporizer feed pipe which extends through a hole in the wall of the combustion chamber and separably connects the vaporizer with said valve casing, a valveless pipe connected with the discharge end of the vaporizer and extended out through the same hole in the wall of the combustion chamber and terminating in a nozzle which discharges into said mixing tube, and an independent feed pipe for said sub-burner, substantially as specified.

2. The combination of a main burner having a mixing tube, a casing above the main burner inclosing the combustion chamber, a sub-burner which extends up through the main burner, and a vaporizer within said combustion chamber and extending over the sub-burner and over part of the main burner, with a feed pipe, a valve casing secured to said feed pipe, a vaporizer feed pipe permanently connected with the inlet end of the vaporizer and extending through a hole in the wall of the combustion chamber and separably connected with said valve casing, a valveless pipe connected with the discharge end of said vaporizer and extending out through the hole in the wall of the combustion chamber and terminating in a nozzle which discharges into said mixing tube, and an independent feed pipe for said sub-burner, substantially as described.

3. The combination of a main burner having a mixing tube, and a casing above said main burner inclosing the combustion chamber and having a hole through one side just above the burner, a fixed support P in the combustion chamber having a hole in it, a vaporizer adapted to be inserted into the combustion chamber through the hole in its side wall and having a boss at one end which enters the hole in said fixed support, a valve casing located outside of said combustion chamber and containing a valve, a feed pipe therefor, a vaporizer feed pipe permanently connected with the inlet end of said vaporizer and extending through the hole in the wall of the combustion chamber and being separably connected with the discharge end of said valve casing, and a valveless dis-

charge pipe connected with the discharge end of the vaporizer and extending out through the hole in the wall of the combustion chamber and terminating in a nozzle which discharges into said mixing tube, and an independent feed pipe for the sub-burner substantially as described.

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

ROLLIN H. WHITE.

Witnesses:
E. L. THURSTON,
E. B. GILCHRIST.