A. J. SLADEK & L. STONE.

GAS GENERATOR.

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898,935. Patented Sept. 15, 1908.

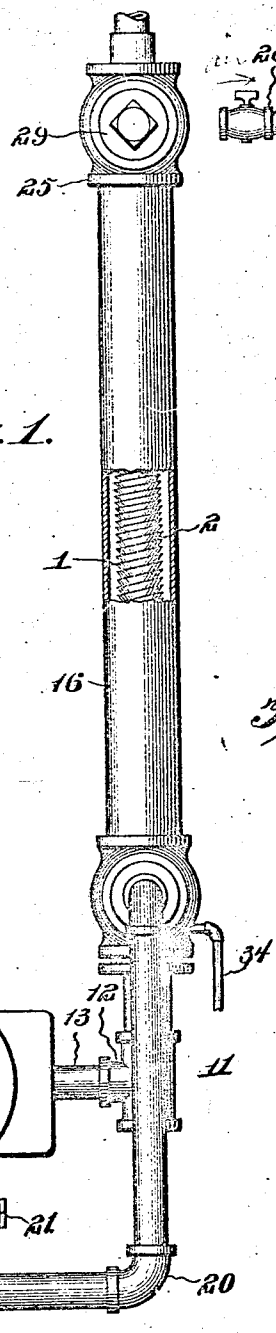

Fig. 1.

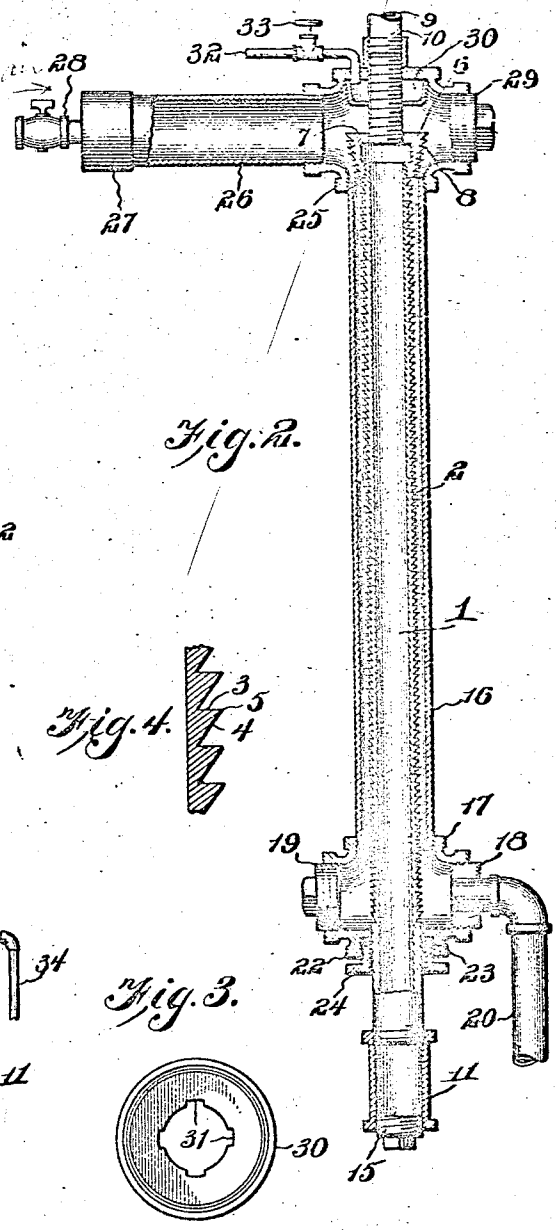

Fig. 2.

Fig. 4.

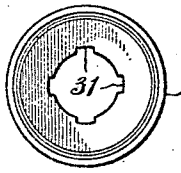

Fig. 3.

Witnesses

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GAS-GENERATOR.

No. 898,935. Specification of Letters Patent. Patented Sept. 15, 1908.

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To all whom it may concern:

Be it known that we, ALBERT J. SLADEK and LEON STONE, citizens of the United States of America, residing at Paris, in the county of Monroe and State of Missouri, have invented new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention is an improved gas generator adapted to convert kerosene, crude oil, or other liquid hydrocarbon into an explosive gas for use in an engine of the explosive type and also adapted for use in other connections, and the same consists in the construction, combination and arrangement of devices hereinafter described and claimed.

In the accompanying drawings,—Figure 1 is a side elevation of a gas generator constructed in accordance with this invention, a portion of the carbureter conduit being broken away to disclose a portion of the exterior of the heating conduit. Fig. 2 is a sectional view of the same on a plane at right angles to Fig. 1. Fig. 3 is a detail top plan view of the cup into which the liquid hydrocarbon is fed. Fig. 4 is a detail sectional view of the heating conduit.

In accordance with this invention we provide a heating conduit through which passes a suitable heating medium, such, for instance, as the heated air and spent gases exhausted from an explosion engine. We first describe an embodiment of such heating conduit.

A tube 1 of suitable length and diameter is exteriorly spirally threaded, as at 2, such spiral thread extending from nearly the upper end thereof to within a suitable distance of the lower end thereof. The said tube is upright, and said spiral thread presents a flat upper surface 3 and an inclined lower surface 4, such surfaces converging to a sharp edge 5. To the upper end of the tube 1 is screwed a cap 6 of inverted truncated conical form and the least diameter of which exceeds the outside diameter of such tube 1. Said truncated conical cap has a flat upper surface 7 and is provided with an exterior spiral thread 8 which is similar in form to that on the tube 1. A tube 9, which is of less diameter than the tube 1, has its lower portion screw threaded, as at 10, and is screwed in and extends through a central opening in the upper portion of the cap, opposite the upper end of the tube 1. To the lower end of said tube 1 is screwed a tee 11, the horizontal arm 12 of which is of reduced diameter adapted for the attachment of a pipe 13 which leads from the exhaust of an explosion engine, indicated at 14. The vertical arm of the said tee is of greater diameter than the tube 1, and the lower end of such vertical arm of the tee is closed by a screw plug 15 which is removable therefrom and which when removed enables access to be obtained to the interior of the tube 1. Such tube 1 has its major portion disposed in and extended through a carbureting or gas and air mixing conduit 16 which is here shown as a tube of greater diameter than the heating and generating tube 1.

A cross coupling 17 is screwed to the lower end of the tube 16, and its horizontal arm has its ends provided with removable screw plugs 18, 19. Such screw plug 18 has a threaded opening in which is screwed the upper end of a feed pipe 20, which in practice leads to the engine 14 to supply the explosive mixture of gas and air to such engine and is provided with an air valve 21 to enable such explosive mixture to be diluted with air in any suitable proportion, according to the extent to which such valve is open. In the lower side of the cross coupling 17 is an opening through which the lower portion of the heating and generating tube or conduit 1 extends, and a packing chamber 22 is also formed on the lower side of such cross coupling for the reception of packing 23 and a gland 24, which gland is screwed in such packing chamber and compresses the packing 23 so as to compress the latter around the lower portion of the heating and generating tube 1 to effect a perfectly tight joint between such tube 1 and such cross coupling. A similar cross coupling 25 is screwed to the upper end of the carbureting or gas and air mixing conduit or tube 16. To one end of the horizontal arm of such cross coupling is screwed the inner end of a tube 26 which forms in effect a storage or reservoir chamber and also forms an air conduit

leading to and communicating with the gas and air mixing or carbureting conduit 16. Said tube 16 is provided at its outer end with a reducer cap 27 to which is connected an air-intake valve 28. The cap 6 is in the lower portion of the upper cross coupling 25. A plug 29 is screwed in the end of the horizontal arm of such cross coupling opposite that to which the tube 26 is connected. In the upper portion of such cross coupling is a feed cup or pan 30 which is screwed on the tube 9 and is provided with small openings 31 in the bottom to permit kerosene, crude oil, or other suitable liquid hydrocarbon to pass from such cup to the exterior of the tube 9. A fuel feeding pipe 32 passes through the upper side of the cross coupling 25 to discharge oil or other suitable liquid hydrocarbon into the said cup 30 and is provided with a fuel feed regulating valve 33 which is preferably a needle valve. An overflow pipe 34 of suitable diameter leads from the lower cross coupling 17 to prevent oil or other liquid hydrocarbon from accumulating in the carbureting or gas and air mixing conduit formed by the pipes 16 and the couplings which are connected thereto.

The operation of the invention is as follows: Assuming that the engine is in operation and the exhaust is being discharged therefrom through the heating and gas generating conduit consisting of the tubes 1, 9 and the cap 6, such conduit will become highly heated by the spent gases and other products of combustion in the engine. The fuel feed tube 32 being opened to the required extent by the regulating valve 31, kerosene oil, crude oil, or other suitable liquid hydrocarbon will be supplied to the cup 30 and will pass from such cup through the openings 31 to the exterior of the tube 9 and from thence to the outer surface of the cap 6 will pass down the spiral threads on such cap and on the tube 1, and hence will be disposed in a film which, as it passes down and around the tube 1, will be constantly exposed to the air drawn through the valve 28, tube 26, coupling 25, 17, tube 16 and tube 20 by the suction of the engine. It will be understood that the tube 1, being as before stated highly heated by the products, will heat such air by radiation and furthermore that owing to the heated condition of such conduit 1 the film of liquid hydrocarbon on the coiled exterior thread thereof will be converted into gas, which gas will serve to carburet the air that passes through the conduit 16. In other words, the gas which is generated from the liquid hydrocarbon will be commingled with the air drawn through the carbureting conduit by the suction of the engine to produce an explosive mixture which will be supplied to the engine by the generator. Such mixture of gas and air may be diluted to any required or desirable extent by appropriately opening the valve 21. Furthermore, the volume of air admitted to the generator may be controlled by appropriately opening the valve 28. The length and diameter of the tubes 16 and 26 of the cross couplings 17 and 25 are such as to cause the carbureting or gas and air mixing chamber or conduit to also constitute a gas reservoir which, after the engine has been stopped and the valves 33, 28 and 21 have been closed, will contain a sufficient quantity of gas or commingled gas and air to restart the engine. By first removing the plug 15 and applying a suitable torch to the opening formed by the removal of such plug at the bottom of the heating and generating conduit the latter may be heated to the required extent to start the engine in the event that there is no store of gas in the carbureting conduit.

A gas generator embodying our invention may be readily manufactured at a comparatively small cost and may be constructed almost wholly of ordinary plumbers' supplies which may be readily purchased at reasonable cost in the open market.

In practice the carbureting conduit will preferably be provided with a suitable asbestos or other packing to prevent loss of heat by radiation.

Having thus described the invention, what is claimed as new, is:—

1. A gas generator comprising an upright outer tube, a cross coupling at the upper end thereof having a closure at one end, a tube attached to the opposite end of said cross coupling, and having a closure and a valve at its outer end, a cross coupling at the lower end of said upright tube, having closures at its ends, and a tube leading from one of said closures; an upright tube of less diameter than and extending through the outer tube and the cross couplings and forming a duct for a heating medium, and means to apply a liquid hydrocarbon to the exterior of that portion of the said inner tube within the outer tube, for the purpose set forth.

2. A gas generator comprising an upright tube, a cross coupling at the upper end thereof having a closure at one end, a tube attached to the opposite end of said cross coupling, and having a closure and a valve at its outer end, a cross coupling at the lower end of said upright tube having closures at its ends, and a tube leading from one of said closures; an upright tube of less diameter than and extending through the upper tube and the lower cross coupling and provided at its lower end with a closure, said inner upright tube having an exterior spiral thread, an inverted conical cap at the upper end of said inner tube in said upper cross

coupling, and having an exterior spiral thread, an exteriorly threaded tube of less diameter than said inner tube communicating with said inner tube, connected to said cap and the upper side thereof, a cup on the said smaller tube and provided with a perforated bottom and means to supply liquid hydrocarbon to said cup.

In testimony whereof, we affix our signatures in presence of two witnesses.

ALBERT J. SLADEK.
LEON STONE.

Witnesses:
E. K. STONE,
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