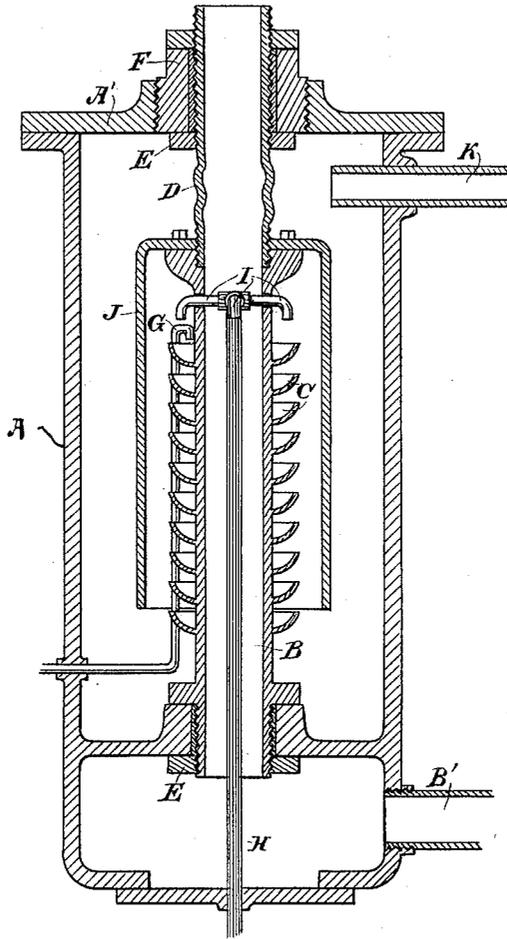


(No Model.)

A. J. TACKLE.
GAS GENERATOR.

No. 600,298.

Patented Mar. 8, 1898.



Witnesses,
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UNITED STATES PATENT OFFICE.

ARNOLD J. TACKLE, OF OAKLAND, CALIFORNIA.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 600,298, dated March 8, 1898.

Application filed April 15, 1897. Serial No. 632,285. (No model.)

To all whom it may concern:

Be it known that I, ARNOLD J. TACKLE, a citizen of the United States, residing at Oakland, county of Alameda, State of California, have invented an Improvement in Generators for Gas-Engines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus designed to produce an explosive vapor or gas from a petroleum-oil or volatile hydrocarbon for use in gas-engines.

It consists in details of construction which will be more fully explained by reference to the accompanying drawing, in which the figure is a vertical section of my apparatus.

My generator consists of an outer casing A, having a removable cap or cover A', which may be secured by bolts to make a close joint.

Through the center of the bottom of the generator is a pipe B, which extends about three-fourths of the way up to the top. Fixed around this pipe are saucer-shaped cups C, extending successively from near the top to near the bottom.

A corrugated pipe D is screwed into the top of the pipe B and forms a continuation thereof extending up through the cover and being secured by a lock-nut E and collar F, screwed through the cover, so as to make a tight joint.

The lower end of the pipe B, extending downwardly through the bottom of the outer casing A, is connected with the pipe B', so that the exhaust-gas from the engine introduced into this pipe passes up through the center of the apparatus and is discharged through the extension of the corrugated pipe.

The object of the corrugations D is to allow for the unequal expansion of the pipes and the most highly heated parts over the outer casing, which is exposed to a less heat. These corrugations are sufficiently thin to allow of this expansion without altering the relative position of the parts or interfering with the joints which it is desired to keep tight.

A hydrocarbon oil or petroleum is supplied to the uppermost of the cups C by means of a pipe G, extending upwardly through the bottom of the casing A and bent over the top, so as to discharge into the uppermost of the

cups C, from which the oil overflows, and on account of the saucer shape of the cups the overflow will be evenly distributed over the lower sides of the same, thus exposing it over a considerable surface by evaporation, and as it leaves each of the saucer-shaped cups it is brought into direct contact with the outer surface of the pipe B, over which it flows into the next cup below, and the action is thus repeated until the oil is finally discharged from the lowermost of the cups C. These cups are thin and easily transmit heat, and, being flatter on the bottom and near the central pipe, the oil flows more slowly and is longer subjected to the heat, thus giving a larger evaporating capacity.

Through the center of the pipe B extends an air-supply pipe H, and at the top, above the uppermost of the cups C, this pipe H has radial horizontally-diverging arms I, the outer ends of which pass through the pipe B and are bent downwardly, so that air admitted into the apparatus is discharged approximately into or above the uppermost of the cups C.

J is a casing intermediate between the outer casing A and the inner pipe B, secured to an enlargement or collar at the upper end of the pipe B, where it forms a close joint, and extending downwardly to about the level of the lowermost of the cups C. This casing is open at the bottom.

K is a pipe or passage leading to the engine, and this engine, acting in the usual manner of gas-engines, first draws in a charge of explosive vapor from the generator and afterward compresses it on the return of the piston, when it is ignited, and, the explosion taking place, forces the piston to the end of the stroke.

The first operation of drawing a charge from the generator causes the air to enter through the pipe H, and as it passes up through the larger exhaust-pipe B the hot exhaust-gas from the engine, passing through this pipe, heats the air, so that it is discharged from the arms I at the upper end at a considerable temperature. The oil flowing down through the cups C successively and against the pipe B is subjected to a temperature sufficiently high to vaporize the volatile portions, which immediately mix with the air, and, passing

downwardly through the inner casing J, the mixing of the air and the vapor is made sufficiently intimate before the mixture passes out at the lower end of the casing J. Having
 5 thus passed out of this casing the vapor or explosive mixture then passes up within the outer casing A until it reaches the passage K, leading to the engine. This operation continues as long as the engine is in operation
 10 and a constant supply of vapor is provided for the operation of the engine.

The pipe G extends upwardly between the cup C and the casing J, not having contact with either, and thus the different rates of
 15 expansion will not in any way interfere with each other.

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

20 1. A generator for gas-engines consisting of an exterior casing, having an inlet for the exhaust from an engine and a pipe or passage for conveying vapor to said engine, a pipe, centrally disposed in said casing and fixed
 25 thereto, said pipe having a threaded opening in its top and saucer-shaped cups one above the other around its outer periphery, a pipe D, screwed into said threaded opening and forming an extension of said central pipe, and
 30 having its outer end threaded and passing through the top of the exterior casing, a collar, screwed into the cover of the casing and surrounding the upper threaded end of the pipe D, a lock-nut engaging the pipe D,
 35 and means for supplying air and oil to said generator, said pipe D having corrugations formed in it between its threaded ends whereby the unequal expansion of the pipe and casing are compensated.

40 2. A generator for gas-engines consisting of an exterior closed casing, a pipe extending vertically upward through the center of the casing with an extension from its upper end through the top of the casing, and a compensating device for unequal expansion formed
 45 by corrugating the uppermost pipe, saucer-

shaped cups surrounding the first-named pipe from the top downwardly in succession, an inclosing open-bottomed casing fixed to the top of the pipe and surrounding the cups
 50 within the outer casing, a pipe whereby oil is supplied to the uppermost of the cups and allowed to overflow from one to the other successively, and an air-supply pipe extending upwardly within the central exhaust-pipe,
 55 said air-pipe having branches or arms extending through the sides of the exhaust-pipe and delivering air into the inclosed chamber above the oil-containing cups.

3. In a generator for gas-engines, an exterior casing having a discharge-pipe from the upper portion adapted to connect with the engine, a centrally-disposed vertical pipe extending upwardly through the center of the bottom of the casing through which pipe the
 60 hot exhaust products from the engine are discharged, annular cups surrounding said pipe in succession from near the bottom to near the top, an inclosing open-bottomed casing intermediate between the cups and the
 70 outer casing, a supply-pipe through which oil is delivered into the uppermost of the cups and allowed to overflow therefrom successively into those below, whereby it is brought into contact with the outer surface of the
 75 exhaust-pipe and vaporized, an air-pipe extending upwardly from the bottom within the exhaust-pipe whereby the air thus introduced is heated, and arms or branches extending through the sides of the exhaust-pipe and dis-
 80 charging into the inclosed chamber above the oil-containing cups whereby the air is mixed with the oil-vapor and is carried first downwardly through the inner chamber around the cups and thence upwardly to the dis-
 85 charge-pipe.

In witness whereof I have hereunto set my hand.

ARNOLD J. TACKLE.

Witnesses:

S. H. NOURSE,
 JESSIE C. BRODIE.