U. H. DEERING.

GAS GENERATING SYSTEM.

APPLICATION FILED MAY 19, 1913.

1,111,140.

Patented Sept. 22, 1914

2 SHEETS—SHEET 1.

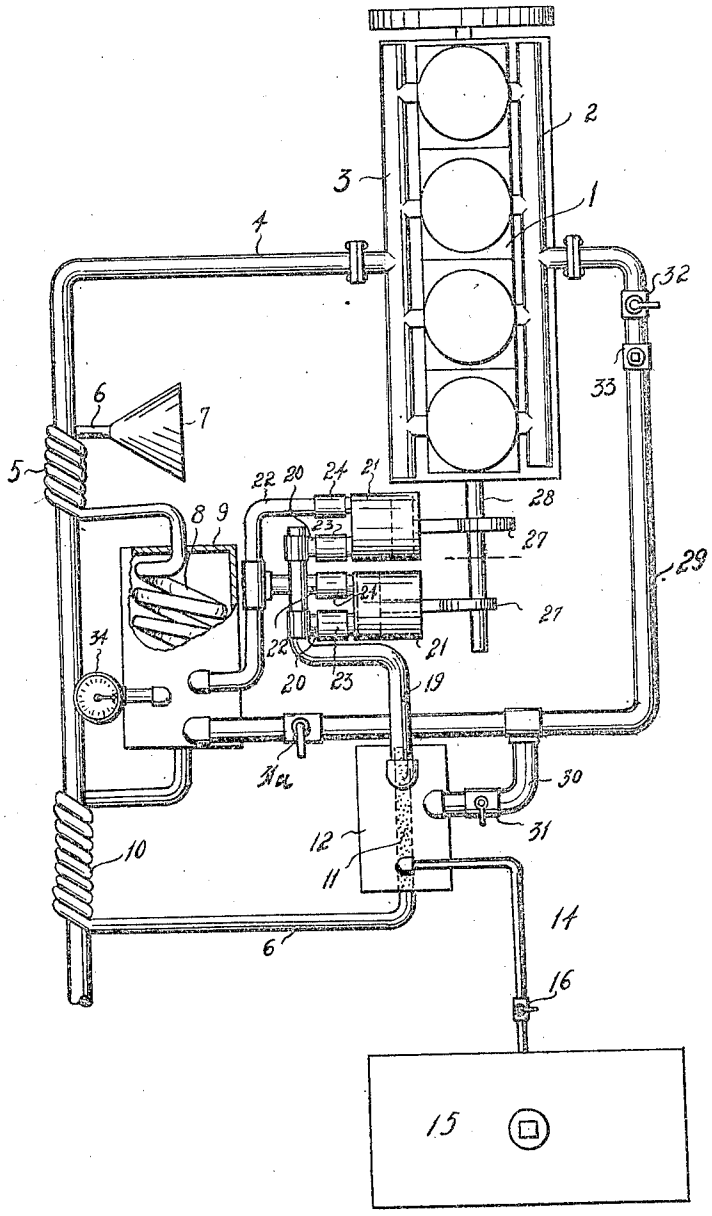


Fig. 1.

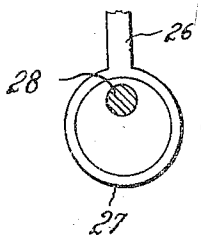


Fig. 2.

WITNESSES:

J. T. Mathews

J. P. Lesselier.

INVENTOR

Uriah H. Deering

BY

John W. Hellman

ATTORNEYS

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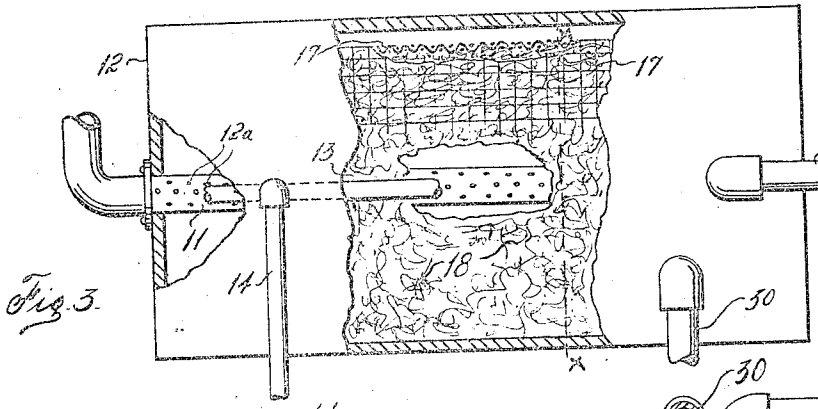


Fig. 3.

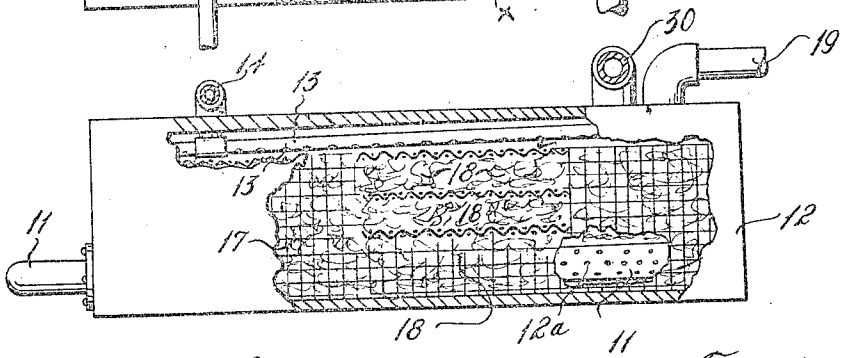


Fig. 4.

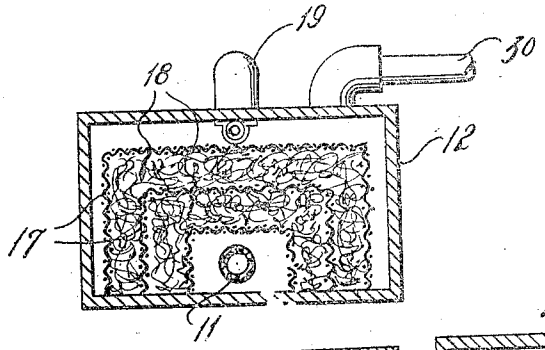


Fig. 5.

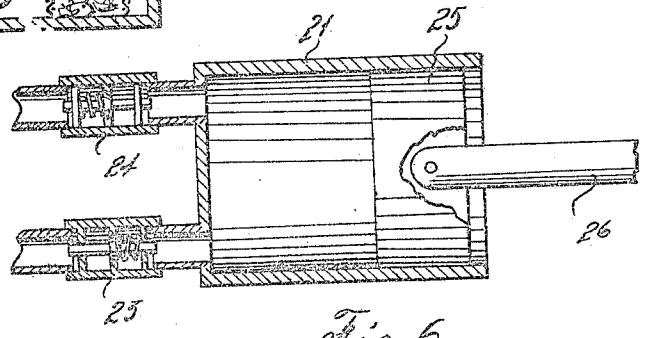


Fig. 6.

WITNESSES:

J. L. Matkin.

J. D. Lockstone

INVENTOR

Uriah H. Deering

BY

John W. Gallaway

ATTORNEYS

UNITED STATES PATENT OFFICE.

URIAH H. DEERING, OF CLEBURNE, TEXAS.

GAS-GENERATING SYSTEM.

1,111,140. Specification of Letters Patent. Patented Sept. 22, 1914.

Application filed May 19, 1913. Serial No. 768,471.

To all whom it may concern:

Be it known that I, URIAH H. DEERING, a citizen of the United States, residing at Cleburne, in the county of Johnson and State of Texas, have invented certain new and useful Improvements in Gas-Generating Systems, of which the following is a specification.

My invention relates to a new and useful gas generating system for explosive engines. Its object is to provide a gas generating system so arranged as to be applicable for actuating any ordinay gasolene engine, and which will permit the gas to be put under compression before entering the engine cylinders.

Another object of my invention is to provide a substitute for the carbureter commonly used, and to thereby eliminate much of the trouble arising from the operation of the present carbureter.

A further object of my invention is to utilize a considerable portion of the heat produced by the exhaust vapors of an explosive engine, said heat being made to vaporize the explosive fluid by which the engine is actuated.

Finally the object of my invention is to provide a device of the character described that will be simple and efficient and comparatively easy to construct, and will not be likely to get out of working order.

With these and various other objects in view, my invention has relation to certain novel features of construction and operation, an example of which is described in the following specification, and illustrated in the accompanying drawings, wherein:

Figure 1 is a diagrammative view showing my gas generating system correlated with an explosive engine. Fig. 2 is a detail view of an eccentric, two of which are employed in my system. Fig. 3 is a plan view of a tank within which the explosive fluid is vaporized and mixed with air, a portion of the tank being broken away showing interior construction. Fig. 4 is a view of said tank in side elevation showing a portion of the interior construction. Fig. 5 is a transverse sectional view of the tank, the section being taken upon the line X—X of Fig. 3. Fig. 6 is a sectional view showing one of two air pumps which are embodied in my invention, the intake and exhaust valves of said pump being included in this view.

Referring now more particularly to the drawings, wherein like reference characters designate similar parts in all the figures, the numeral 1 denotes a four cylinder explosive engine, the intake and exhaust manifolds thereof being respectively indicated by the numerals 2 and 3. Upon the exhaust pipe 4 of said engine there is coiled a portion of 5 of a pipe 6, which pipe has an extremity with a funnel shaped inlet 7 adjacent to the portion 5. The portion 6 also includes a series of coils 8 disposed within an airtight tank 9. After leaving the tank 9, the pipe 6 is again coiled upon the pipe 4 for some distance as indicated at 10. Passing from the pipe 4, the pipe 6 finally terminates in a perforated portion 11 centrally disposed within an airtight tank 12, the perforations being designated by the numeral 12^a. The portion 11 of the pipe 6 is central only with relation to the side wall of the tank 12, and lies adjacent to the floor of said tank.

Within the top portion of the tank 12 there is supported a pipe 13 having a line of perforations formed in its under side the pipe being disposed above the member 11 and parallel thereto. The pipe 13 has communication through the top of the tank 12 with a pipe 14, leading to a gasolene storage tank or reservoir 15, the passage of fluids through the pipe 14 being controlled by an ordinary valve 16.

Within the tank 12 there are disposed a plurality of wire screen members 18 having the form of inverted channels, said members being successively increased and equidistantly spaced, the side of each member being parallel to and equidistant from the pipe 11. The space between the members 17 is filled with waste or some other fibrous material as indicated at 18. The smallest member 17 will preferably be spaced somewhat from the pipe 11, and the largest member 17 is spaced from the top and side wall of the tank 12.

With the tank 12 (preferably through the top thereof) there communicates one extremity of a pipe 19, having communication at its other end with the intake pipes 20 of two adjacent air pumps 21. The interior construction of said pumps is shown in Fig. 6, each pump having one end open and having communication with intake and exhaust pipes through the other end which is closed. The exhaust pipes of the two pumps, which are designated by the numeral 22, lead to and communicate with the tank 9. The in-

take and exhaust pipes of the two pumps are respectively provided with check valves 23 and 24, both normally seated, the former being adapted to automatically open during the suction stroke of the pump and the latter during the compression stroke. The interior construction of these valves is clearly shown in Fig. 6, and since such valves are in common use and well known, no further description of the same is necessary. The piston heads 25 of the two pumps are actuated through connecting rods 26 by eccentrics 27 carried by the engine crank-shaft 28. The members 27 have an opposite eccentricity so that the piston head of one pump will be making a compression stroke while the other is making a suction stroke.

The intake pipe 29 of the engine 1 leads to and communicates with the tank 9 and also has communication through a branch pipe 30 with the tank 12 preferably through the top thereof. A throttle valve 31 is provided in the pipe 30 and another valve 31ª provided in the pipe 29 between the point where said pipe communicates with the tank 9 and the pipe 30. A throttle valve 32 and a check valve 33 are provided in the pipe 29 between its points of communication with the manifold 2 and the pipe 30.

A pressure gage will preferably be mounted upon the tank 9 to indicate the amount of compression of the explosive gas which is to be stored within said tank.

An explanation will now be given with regard to the operation of my system above described.

When the engine is first started there will be of course air unmixed with explosive vapor in the tank 9. Communication between the intake pipe 29 and the tank 9 will therefore be cut off when the engine is being started for the first time by closing the valve 31ª. The valve 31 in the pipe 30 is then opened and the valve 16 is permitted to stand open some time since it is necessary to permit a considerable flow of gasolene when the engine is first started in order that the fibrous material 18 within the tank 12 may become thoroughly saturated with the explosive fluid. The engine shaft will now be manually subjected to several revolutions producing several strokes of the pump piston-heads, and creating a suction within the tank 12 that will cause a current of air to flow through the pipe 6 of said tank passing through the gasolene saturated fibrous material. The passage of the air through the saturated material 18 will vaporize a certain portion of the gasolene producing a weak explosive mixture which will be drawn through the pipe 30 into the intake pipe of the engine and will set the engine into operation. Once the engine begins to operate the exhaust pipe 4 will become considerably heated due to the passage of the exhaust vapors therethrough, and a portion of this heat will be communicated to the current of air passing through the coils 5 and 10. The air escaping into the tank 12 through the perforation 12ª will soon become sufficiently heated to vaporize the greater portion of the gasolene with which the material is saturated thus producing a strong explosive fluid.

It is to be understood that the process above described is necessary only when the engine is first put into use. After the engine is in operation, the valve 31 in the pipe 30 will be closed and the valve 31ª in the pipe 29 will be opened. Since the engine has been permitted to operate for some time, the tank 9 will now be filled with a gaseous explosive mixture which has been compressed in said tank by the pump 21. This compressed explosive gas will now pass to the engine through the intake pipe 29 and will give to the engine an increased efficiency owing to the pressure under which it enters the explosion chamber. The pressure of the gas in the tank 9 will remain substantially constant since it is drawn from said tank through the pipe 29 at the same rate that it is forced into said tank by pumps 21. The check valve 23 will serve to prevent the engine from back firing. After the engine has once been put in operation, there will always be a supply of the gaseous explosive mixture in the tank 9, so that there will be no difficulty in again starting the engine. Of course it is understood that the valve 16 will be so adjusted as to admit to the tank 12 only a sufficient quantity of gasolene to produce the desired explosive mixture. The pipe 13 will serve to distribute the gasolene throughout the entire length of the tank 12.

When the above described system is once set into operation, and the flow of the fluid is properly regulated, the proper mixture of gasolene vapor and air will be continuously formed within the tank 12 and the trouble so frequently experienced with the common carbureter will be eliminated.

The invention is presented as including all such modifications and changes as properly come within the scope of the following claims.

What I claim is:

1. In a device of the character described, the combination with an internal combustion engine, of a pump actuated thereby, a gas generating and air mixing tank having its intake communicating with the intake of said pump, a reservoir for explosive fluids, adapted to discharge into said tank, a storage tank for a gaseous explosive fluid having communication with the outlet of said pump, a fluid conducting connection be-

tween said storage tank and the inlet of the engine, means for conducting air into the gas generating and air mixing tank, and means for heating the air before its introduction into said tank.

2. In a device of the character described, the combination with an internal combustion engine, of a pump actuated thereby, a gas generating and air mixing tank, having fluid conducting connection with the intake of said pump, a reservoir for an explosive fluid, adapted to discharge into said tank, a storage tank for a gaseous explosive fluid having fluid conducting communication with the outlet of said pump, and means for utilizing the exhaust gases of the engine to heat a current of air and to conduct said current into the gas generating and air mixing tank.

3. In a device of the character described, the combination with an internal combustion engine, of a pump actuated thereby, a gas generating and air mixing tank, with which the intake of said pump has fluid conducting connection, a reservoir for explosive fluids, adapted to discharge into said gas generating and air mixing tank, a storage tank for a gaseous explosive fluid having fluid conducting connection with the outlet of said pump, a fluid conducting connection between said storage tank and the intake pipe of said engine, a pipe communicating with the exhaust port of the engine, and a pipe communicating at one extremity with the atmosphere and at the other with the gas generating and air mixing tank, formed with coils about the pipe communicating with the engine exhaust port, and formed with a coil within the said storage tank.

4. In a device of the character described, the combination with an internal combustion engine, of a pump actuated thereby, a gas generating and air mixing tank, with which the intake of said pump has fluid conducting connection, means for conducting an explosive fluid to the gas generating and air mixing tank, a storage tank for a gaseous explosive fluid, having fluid conducting connection with the outlet of said pump, a fluid conducting connection between said storage tank and the intake pipe of the engine, and a pipe arranged to derive heat from the exhaust gases of the engine, open at one extremity to the atmosphere, and having its other extremity extended into the gas generating and air mixing tank and perforated within said tank, said pipe being formed with a coiled portion within the storage tank.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

URIAH H. DEERING.

Witnesses:
J. W. NORWOOD,
J. C. BLAKENEY.