No. 776,982. PATENTED DEC. 6, 1904.

J. D. ANDERSON.

CARBURETING APPARATUS FOR EXPLOSIVE ENGINES.

APPLICATION FILED JAN. 4, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

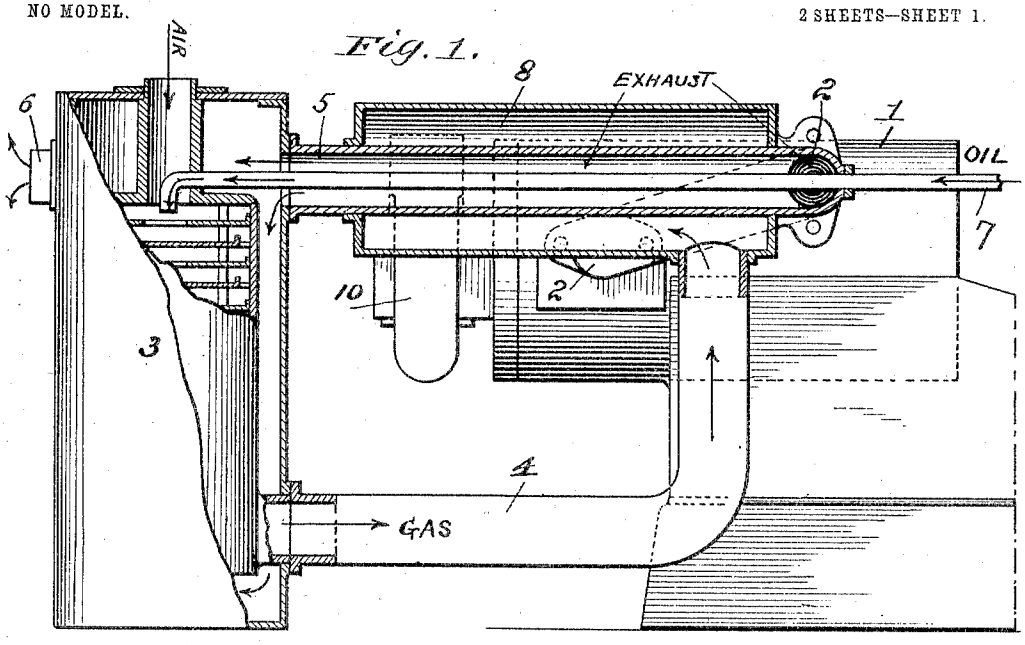


Fig. 2.

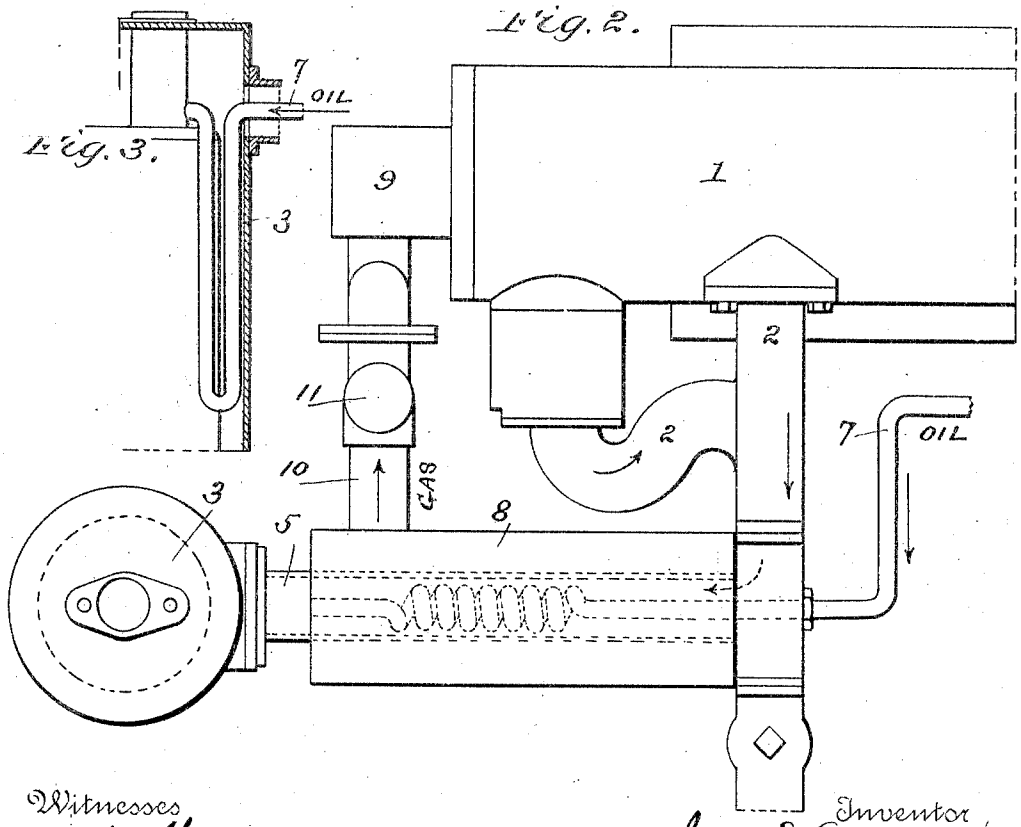


Fig. 3.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

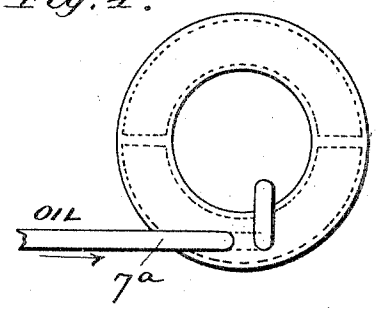


Fig. 5.

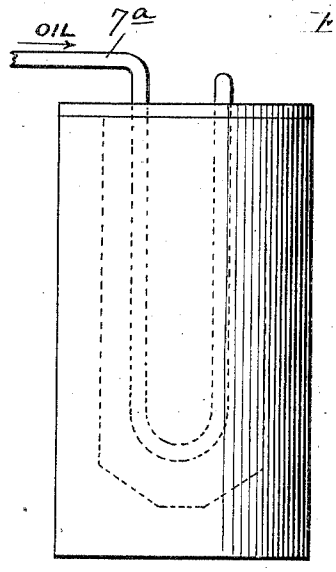
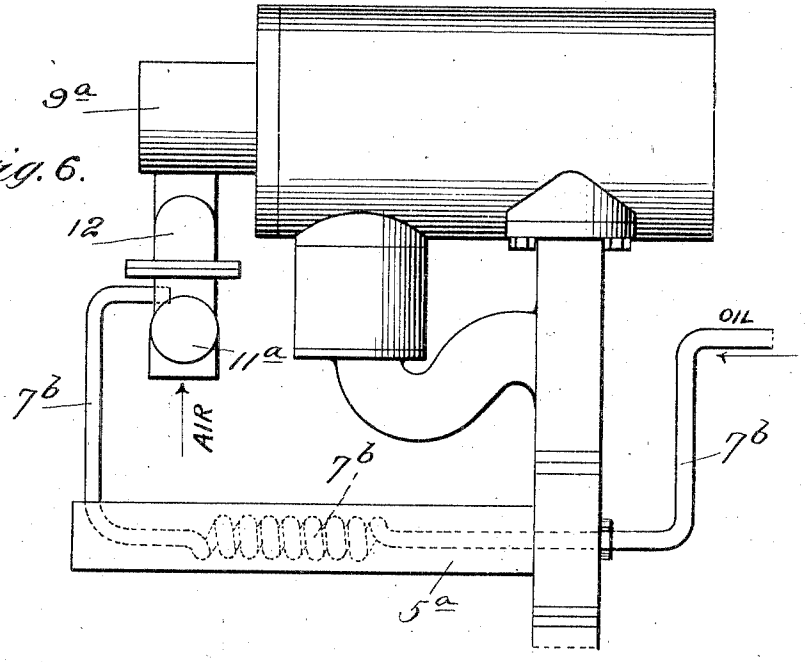


Fig. 6.



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No. 776,982. Patented December 6, 1904.

UNITED STATES PATENT OFFICE.

JOSEPH D. ANDERSON, OF ST. MARYS, OHIO.

CARBURETING APPARATUS FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 776,982, dated December 6, 1904.

Application filed January 4, 1904. Serial No. 187,654. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH D. ANDERSON, a citizen of the United States, residing at St. Marys, county of Auglaize, State of Ohio, have invented certain new and useful Improvements in Carbureting Apparatus for Explosive-Engines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in vertical section, of the apparatus attached to an engine-cylinder; Fig. 2, a plan view thereof; Fig. 3, a detail view showing the oil-heating pipe arranged within the vaporizing-chamber; Fig. 4, a plan view of an arrangement of oil pipe and vaporizer similar to that shown in Fig. 3; Fig. 5, a side elevation of the arrangement shown in Fig. 4, and Fig. 6 a detail showing a modified form of apparatus.

The main object of this invention is to provide an apparatus by which the waste gases from the exhaust of the engine will be employed to heat the oil on its way to the vaporizing-chamber and also to provide means whereby the said waste gases will reheat the explosive mixture just as said mixture passes into the engine-cylinder. Other and equally important advantages will appear hereinafter.

Referring to the various parts by numerals, 1 designates the engine-cylinder, 2 the exhaust-pipes therefrom, and 3 the heating-jacket of the vaporizing-chamber. I prefer to employ the carbureter or vaporizing means shown in my Patent No. 743,416 of November 10, 1903; but of course any other suitable vaporizing device may be employed. This vaporizer, as indicated in the drawings, comprises an inner receptacle or chamber in which are arranged superposed vaporizing-plates, over which the oil and air pass from top to bottom, the gas passing therefrom at the bottom of the chamber through the outlet-pipes 4. The waste gases from the engine pass into the jacket of the vaporizing-chamber through an inlet-pipe 5 and pass around the inner compartment and out through the exhaust-port 6, as clearly set forth in the patent mentioned heretofore. The oil is fed to the vaporizing-chamber through the pipe 7, said pipe passing longitudinally through the pipe 5 and into the inner compartment of the vaporizer. It will be thus seen that the oil will be heated to a high temperature by the waste gases in said pipe and will enter the vaporizing-chamber in a highly-heated condition, so that it will be readily vaporized.

Surrounding the exhaust-pipe 5 is an independent reheating-chamber 8, which is connected at one of its ends with the outlet-pipe 4 from the vaporizing-chamber, so that the gas from said chamber will be delivered into the reheating-chamber. This chamber is connected to the mixer 9 at the inlet end of the engine-cylinder by means of a pipe 10, in which is arranged the usual inlet check-valve 11 to prevent any gas being driven back into the reheating-chamber by the force of the explosion in the engine-cylinder. The pipe 10 is connected to the chamber 8 at the opposite end thereof from the pipe 4, so that the vapor must pass entirely through said chamber and around the exhaust-pipe therein before it reaches the pipe 10.

The oil-pipe 7 may be arranged longitudinally in the exhaust-pipe 5, as shown in Fig. 1, or, if desired, it may be arranged in a coil in said pipe, as shown in Fig. 2. It is obvious that this oil-pipe may also be arranged in a coil in the heating-space in the vaporizing-chamber, as shown in Fig. 3, the object being in all cases to heat the oil by the waste gases from the engine before it is delivered into the vaporizing-chamber.

The purpose of reheating the gas from the vaporizing-chamber is obvious, as it prevents any oil being carried into the engine-cylinder, thereby avoiding the formation of carbon in the cylinder or around the inlet-valves thereof. This is of great advantage, as the formation of carbon corrodes the valves and interferes with their free and positive operation; and it will be observed that this device for insuring a complete vaporization of the oil after the mixture leaves the vaporizer is located just where the exhaust is hottest—namely, between the vaporizer proper and the engine.

In the apparatus shown in Figs. 1 and 2 oil and air are delivered into the vaporizing-chamber at the top thereof and the gas drawn therefrom at the bottom; but it is obvious that

this may be reversed and the gas taken from the top of the vaporizing-chamber and led thence to the reheating-chamber.

The arrangement of the oil-pipe 7ª (shown in Figs. 4 and 5) is substantially the same as the arrangement shown in Fig. 3, except that the oil-pipe enters the vaporizer through the top thereof. It will be observed that in all of these figures the oil-pipe is arranged within the exhaust-receiving compartment which surrounds the vaporizing-chamber. It is preferred to arrange the pipe in this exhaust-compartment at a point near the exhaust-pipe 5 for an obvious purpose.

In Fig. 6 is shown an apparatus in which the carbureting or vaporizing chamber and the reheating-chamber 8 are dispensed with. In this form of the apparatus the oil-supply pipe is arranged in a coil within the exhaust-pipe, so that the oil will be vaporized in said coil by the heat of the waste gases. The oil-vapor is led into an intake-pipe 12 of the engine at a point between the intake-valve 11ª and the mixer-box 9ª of the engine. It will of course be understood that the intake-valve 11ª is to be operated at suitable intervals by mechanism controlled by the engine-governor, as is usual in this class of engines.

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

1. In a carbureting apparatus the combination, of an engine-cylinder, an exhaust-pipe leading therefrom, a vaporizing-chamber heated by said exhaust, an oil-delivery pipe entering the vaporizing-chamber through the exhaust-passage, a gas-outlet pipe leading from the vaporizing-chamber to the engine, a reheating-chamber inserted in said outlet-pipe between the vaporizing-chamber and the engine, said reheating-chamber surrounding the exhaust-pipe at a point between the vaporizer and the engine, whereby the exhaust will first heat said reheating-chamber and then the vaporizing-chamber.

2. In a carbureting apparatus the combination, of an engine-cylinder, an exhaust-pipe leading therefrom, a vaporizing-chamber heated by said exhaust, an oil-pipe connected to said vaporizing-chamber, a gas-passage connecting the vaporizing-chamber to the inlet of the engine, and an independent reheating-chamber inserted in said gas-passage between the vaporizing-chamber and the intake of the engine-cylinder for reheating the gas from the vaporizing-chamber, said reheating-chamber being heated by the exhaust before the exhaust reaches the vaporizing-chamber.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 21st day of December, 1903.

JOSEPH D. ANDERSON.

Witnesses:
JOS. C. SCHNEBLE,
F. D. CLARK.