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 REVAPORIZER FOR INTERNAL COMBUSTION ENGINES.
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1,152,744.

Patented Sept. 7, 1915.

Fig. 1.

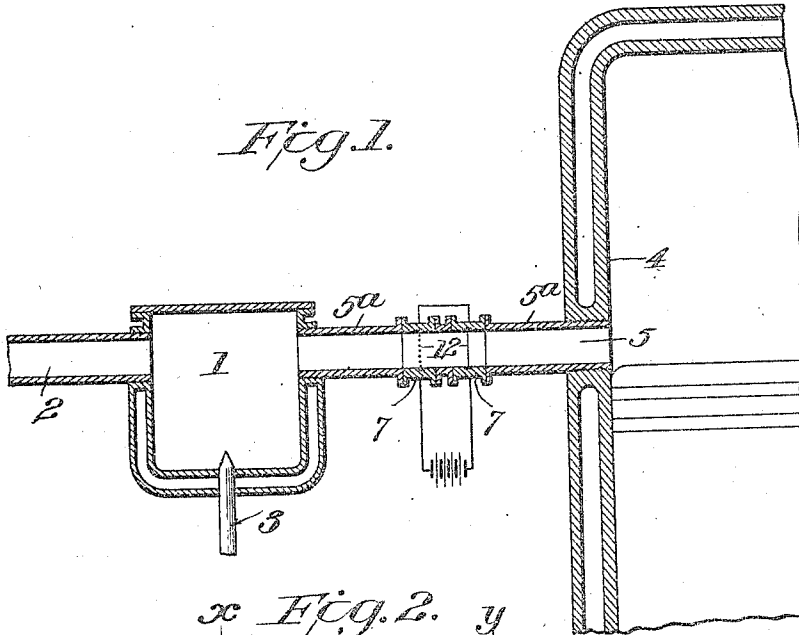


Fig. 2.

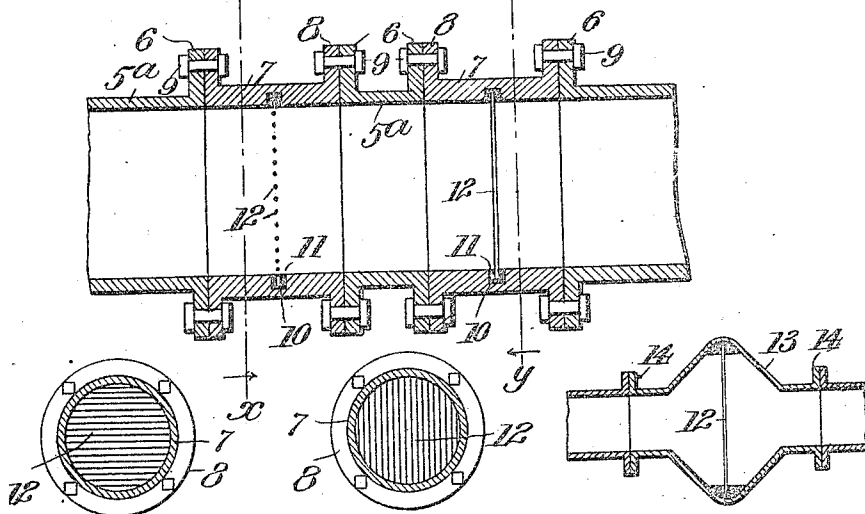


Fig. 3.

Fig. 4.

Fig. 5.

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REVAPORIZER FOR INTERNAL-COMBUSTION ENGINES.

1,152,744.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BARRY MACNUTT, a citizen of the United States, residing at South Bethlehem, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful improvements in Revaporizers for Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to internal combustion engines and especially to means for revaporizing any raw fuel which may become condensed during the passage of the vapor from the carbureter to the cylinder of the engine.

The pipe leading from the carbureter to the cylinder often becomes covered with frost even in warm weather, due to the rapid vaporization of the fuel. The coldness of this pipe has a tendency to condense the vapor during its passage therethrough, forming drops of raw fuel which pass into the cylinder with injurious effect. Furthermore, the high velocity of the air passing through the carbureter often carries drops of fuel over into the cylinder without giving said drops a chance to become vaporized. This unfavorable condition is becoming more prevalent because of the fact that the quality of gasoline obtainable is continually becoming more and more inferior.

The object of my present invention is to prevent any raw fuel from entering the cylinder of the engine. I accomplish this purpose by placing electric conductors, capable of generating heat, in the pipe leading from the carbureter to the cylinder. The effect of these electric conductors is to revaporize any drops of raw fuel which may be condensed in said pipe with the result that when the vapor enters the cylinder, it is entirely free from raw fuel.

My invention consists in the construction and arrangement of the electric conductors, which I employ, in combination with the essential operative parts of an internal combustion engine.

Particular features of construction and combinations of parts constituting my invention are specified in the appended claims.

In the accompanying drawing illustrating the preferred embodiments of my invention: Figure 1 is a sectional view of a car-

bureter, a part of the cylinder of an internal combustion engine, and the pipe connecting said carbureter and cylinder, showing my revaporizer in operative position. The carbureter and cylinder are shown conventionally, my revaporizer being capable of attachment to engines of various known types. Fig. 2 is an enlarged sectional view of the pipe leading from the carbureter to the cylinder showing the revaporizer more in detail. Fig. 3 is a cross section on the line $x-x$ of Fig. 2, looking in the direction of the arrow. Fig. 4 is a cross section on the line $y-y$ of Fig. 2, looking in the direction of the arrow, and Fig. 5 is a sectional view of a modified construction of revaporizer.

Referring more particularly to the drawing, 1 designates the carbureter to which air is furnished by the intake pipe 2 and into which the fuel is delivered by the pipe 3.

4 represents the cylinder of the engine connected to the carbureter by the pipe 5. This is preferably made in sections 5^a having their adjacent ends provided with outwardly extending flanges 6.

My revaporizers 7 are made in the form of rings or short tube sections also provided with outwardly projecting flanges 8 at their ends, whereby they may be readily inserted between the pipe sections 5^a and secured by means of bolts 9 passed through said flanges 6 and 8, and quickly removed for repair or replacing.

The ring or tube section 7 of each of the revaporizers has an annular groove 10 formed in its interior surface. This groove contains insulating material 11 in which the bends of an electric conductor or wire 12 are inserted. The parallel portions of wire or conductor comprise the strands of a grid which extends entirely across the interior of the ring 7. I prefer to use number 20 wire for the electric conductor but it should be understood that other gages of wire or other conducting material may be employed without departing from the spirit of my invention. When number 20 wire is used, the grid should comprise about twenty-five cross pieces or strands to secure the best results.

One or more of the vaporizers or grids may be inserted in the pipe leading from the carbureter to the cylinder. It is preferable to use a plurality and to place adjacent grids so that their cross pieces extend

transversely to one another. I have illustrated two grids or revaporizers in the accompanying drawing but more may be added if found necessary or desirable. It will be observed that, as shown, the cross pieces of one grid are arranged transversely to those of the other, as above explained. The electric conductors or wires constituting the grids may be connected in series, parallel, or in any other suitable manner. I have shown them connected in series. It will be understood, of course, that the terminals of the conductors are connected to a suitable electric generator.

15 The operation of my revaporizer, in general, has been already explained. When the vapor, containing drops of raw fuel, passes through the pipe leading from the carbureter to the cylinder, said drops are revaporized by the heat generated by the grids. The object in using a plurality of grids is to revaporize at the second or subsequent stage any raw fuel which may pass through the first grid. The cross pieces of the second grid are arranged transverse to those of the first grid in order to insure drops of fuel which pass through the first grid coming in contact with the second one. It will be observed that the transverse arrangement of adjacent grids causes the vapor, and such raw fuel as it may contain, to travel a tortuous path through the pipe leading from the carbureter to the cylinder, thereby decreasing the velocity of said vapor to some extent and giving the grids a better opportunity to perform their function of revaporizing the raw fuel.

In order to further lessen the velocity of the vapor as it passes through the pipe connecting the carbureter and cylinder, the grids or revaporizers may be mounted in enlarged globe-shaped couplings 13, as illustrated in Fig. 5. These couplings are provided with flanges 14 at their ends and are attached to the sections of the pipe leading from the carbureter to the cylinder in the same manner as the rings or tube sections 7, already described.

I claim:

1. In an internal combustion engine, the combination, with the engine cylinder, the carbureter, and the pipe connecting them, of a ring in said pipe provided with an annular groove in its inner surface, insulating material in said groove, electric conductors extending across said ring with their ends seated in said insulating material, and means for passing an electric current through said conductors whereby they are heated for the purpose specified.

2. In an internal combustion engine, the combination, with the engine cylinder, the carbureter, and the pipe connecting them, of a ring in said pipe provided with an annular groove in its inner surface, insulating material in said groove, a bent electric conductor having portions extending across said ring, the bends of said conductor being seated in said insulating material, and means to pass an electric current through said conductor whereby the latter is heated for the purpose specified.

3. In an internal combustion engine, the combination, with the engine cylinder, the carbureter, and the pipe connecting them, said pipe being made in sections, of an enlarged globe-shaped coupling interposed between the sections of said pipe, and an electrically heated grid extending across said coupling for the purpose specified.

4. In an internal combustion engine, the combination, with the engine cylinder, the carbureter, and the pipe connecting them, said pipe being made in sections, of an enlarged globe-shaped coupling interposed between the sections of said pipe, and an electrically heated grid extending across said coupling at the point of its greatest internal diameter for the purpose specified.

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

BARRY MacNUTT.

Witnesses:

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