A vaporizing burner includes a combustion chamber having inserted therein a vaporizing body. To this body, the liquid fuel is applied to be vaporized. There air is also means for supplying a combustion air flow to the burner. This flow sweeps along the vaporizing surface of said body, which is made of a porous material having good heat conducting properties and is formed substantially as a cylinder. On the cylindrical outer surface of the body, there are formed spiral channels to force the air flow to move rotationally around the vaporizing body, thereby improving the air-fuel mixture.
TURBULATOR FOR VAPORIZING BURNERS

This invention relates to a vaporizing burner including a combustion chamber having inserted therein a cylindrical vaporizing body comprising a porous material with good heat conducting properties. The burner also comprising means for applying a liquid fuel onto said vaporizing body and means for supplying to the burner a combustion air flow, which during rotation sweeps along the cylindrical surface of the vaporizing body.

In heaters for motor vehicles and boats, it has been necessary, in order to save electric energy, to use vaporizing burners. In these, the liquid fuel is applied to a hot metal plate surface, which accumulates large amounts of coke formed around the vaporizing zone. Probably these accumulations are caused when the fuel, due to surface tension effects and evaporation phenomena, hits parts of the plate surface having a temperature considerably exceeding the boiling point of the fuel. By coating the plate surface with a capillary acting, sintered material, such as asbestos or ceramic fiber, there will be an equalizing effect on the temperature distribution over the vaporizing surface extending from the part cooled by the fuel to the part swept by the flame. Each particle (fraction) of the fuel will thereby have an opportunity to be vaporized before it hits the portion of the surface area with too high temperature. Through this method, the accumulated coke quantity per liter of burned fuel will be considerably decreased.

Another problem connected with vaporizing burners is the asymmetry, since the vaporization must take place relatively locally in the combustion chamber. The intermixture of combustion air will therefore be incomplete and a great excess of air has to be used, with accompanying low combustion efficiency. It has been suggested that a porous vaporizing body be placed in the center in front of a turbulator metal plate. Due to the minimal amount of electric effect available, the pressure of the combustion air and therefore the turbulence caused by the turbulator will be insufficient to provide a complete mixture of gas and air.

The present invention presents a solution of the problem described above. By making the turbulator itself of a sintered material having a great capillary action and good heat conducting properties, the vaporizing zone will be placed symmetrically and near the inlet part of the turbulator. Due to the axial extent and the spiral channels of the turbulator, the largest possible mixture length is obtained. By forming the turbulator outlet in a suitable way, a flame holding is provided against the turbulator so that the turbulator receives enough heat from the flame.

Other objects and advantages of the present invention will become apparent from consideration of the following description taken in connection with the accompanying drawing showing in section a burner according to the invention.

In the drawing, a steel plate housing 1 encloses a combustion chamber 2. In its left end, chamber 2 is provided with a flame holder 3. In the right end of the combustion chamber 2, there is inserted a vaporizing body 4 comprising a porous characteristic, for instance, it may be a sintered material with good heat Conducting properties, e.g. pelleted sinter bronze. A sintered, stainless steel material may also be used. According to the invention and also as shown on the drawing, the vaporizing body 4 is formed as a turbulator with outer spiral channels.

In the center part of the vaporizing body 4, there is provided a chamber 5, in which there is inserted a glow coil ignition member 6. The chamber 5 is through radial bores 7 connected to the outer part of the vaporizing body and is through an axial channel 8 in connection with the left end of the combustion chamber 2. To the right end of the housing 1 is connected a supply tube 9 for the combustion air, this tube 9 surrounding another supply tube 10 for the liquid fuel. The supply tube 10 ends in the chamber 5, in which the fuel flows out onto the chamber wall and through the capillaries of the body 4 is spread throughout the entire body.

Part of the combustion air passing through the bores 7, the chamber 5 and the channel 8 to the left end of the combustion chamber 2 and part of the combustion air is sweeping along the turbulator shaped outside surface of the vaporizing body 4 is thereby caused to perform a rotational movement.

The glow coil ignition member 6 is used to initiate the ignition process in order to heat, vaporize and ignite the fuel. Due to the turbulator shape of the vaporizing body 4 the flame is developed to the left of the body 4, and the heat is conducted upstream along the body for causing vaporization of the fuel near the inlet end of the body.

Instead of a glow coil ignition member it is of course possible to use a spark plug.

We claim:

1. A vaporizing burner including a combustion chamber and inserted therein a vaporizing body, said burner also comprising means for applying a liquid fuel onto said vaporizing body and means for supplying to said vaporizing body a combustion air flow whereby said fuel and air mix in said vaporizing body, said vaporizing burner comprising a porous material having good heat conducting properties and being substantially cylindrical shaped, with spiral channels on its outer surface for forcing the mixture of fuel and combustion air flow to move rotationally along said surface and through said combustion chamber.

2. The burner of claim 1 wherein said porous material is a sintered metal.

3. The burner of claim 1 and ignition means inside said vaporizing body.

4. The burner of claim 3 wherein said ignition means is a glow coil inside a chamber co-axial with and inside said vaporizing body, said body having porous walls, said liquid fuel being introduced into said chamber from which it spreads throughout the body via the capillaries formed by said porous walls.

5. The burner of claim 4 wherein said combustion chamber is an elongated cylindrical housing and the spiral surface on said vaporizing body fits snugly into said cylindrical housing, and a flame holder in said chamber downstream from said vaporizing body, said vaporizing body having an end occupying more than half the length of the chamber extending from said flange holder and across the entirety of said vaporizing body.