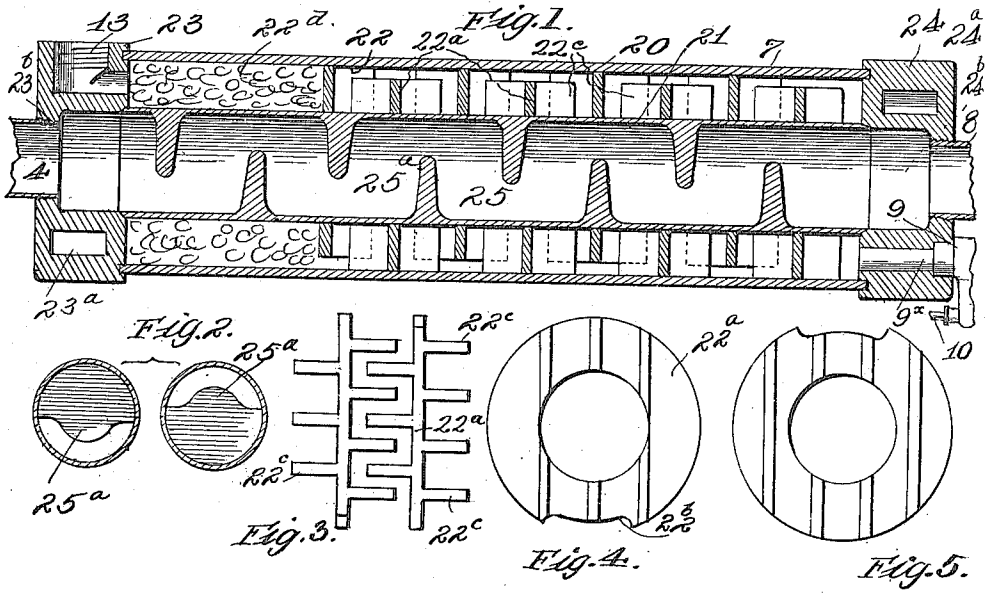
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VAPORIZER.

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WITNESSES:

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VAPORIZER.

1,196,546. Specification of Letters Patent. Patented Aug. 29, 1916.

Application filed August 28, 1912. Serial No. 717,516.

To all whom it may concern:

Be it known that I, CHARLES A. JACOBSON, a citizen of the United States, and resident of Saratoga Springs, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Vaporizers, of which the following is a specification.

This invention relates to a means whereby the heavier hydrocarbon distillates may be used as a fuel in an internal combustion engine.

The object of the invention is to provide means whereby such fuel will be properly conditioned and mixed with air or other combustion supporting medium before being introduced into the engine, which means is better adapted to perform its functions with efficiency, as will be hereinafter more fully described.

In the accompanying drawings, Figure 1 is a longitudinal section, on an enlarged scale, of the gasifying apparatus; Fig. 2 represents by detail views, the upper and lower deflectors of the inner chamber of the gasifying apparatus; Fig. 3 is a detail view showing the relations of the baffles employed in the outer annular chamber of the gasifying apparatus; Figs. 4 and 5 are views looking in the direction of the axis, of two of the members shown in Fig. 3.

In starting the engine, light fuel will be fed through any suitable carbureting or equivalent device. After the engine has gotten well started and the parts warmed up, the light starting fuel is substituted by a heavier distillate, for instance kerosene, and in order to properly condition this to insure desired efficiency, a gasifying apparatus 7 is provided, through which the exhaust is discharged through the manifold connection 4 and from which the spent gases escape through a pipe 8. The heavier fuel is delivered through a mixing valve 9 which receives the fuel through a pipe 10 and the air to be mixed therewith, through any suitable inlet, which preferably leads from a warming muff surrounding the exhaust discharge 8. The mixing valve 9 delivers the mixture of oil and air into the gasifier 7 (to be hereinafter described in detail) from which the mixture escapes through a suitable pipe connected at 13.

The illustrative embodiment of the gasifying apparatus, as disclosed in Figs. 1 to 5, comprises concentric walls 20 and 21, leaving an annular space 22 between them, which is closed by the heads 23, 24, also a chamber 25. The essential characteristics of chamber 25 are that it communicates with the engine exhaust so as to have its wall highly heated thereby, and it is in such relation to the space 22 as to effectively heat the latter as well as the baffles located therein, preferably by having one wall common to both said space 22 and the exhaust chamber 25. It is immaterial whether the exhaust chamber 25 be interior or exterior to the space 22. It might even be partly interior and partly exterior. The chamber 25 is preferably made to communicate with the exhaust pipes 4 and 8, while the annular chamber 22 preferably provides the passage for the mixture of oil and air when running on the heavier fuel, for which purpose it is provided with a port 9^x at one end and a port 13^a at the other end. Within the central chamber 25 are arranged approximately semi-cylindrical deflectors 25^a, located alternately on diametrically opposite sides of the central chamber and extending sufficiently past the axis to effectively deflect against the cylindrical walls of the chamber 25, the hot exhaust gases coming from the engine. The deflectors 25^a are preferably constructed with thickness gradually increasing toward the wall of the chamber which carries them, so that being themselves highly heated by the impinging gases, they readily conduct the heat to the chamber wall and heat the chamber 22. In the annular chamber 22 are located annular baffles 22^a, each adapted to substantially fill the annular space between the walls 20, 21, but provided each on one side with a recess 22^b providing an escape opening. The baffles 22^a are positioned with the recesses 22^b alternately at diametrically opposite points, so that the mixture of air and oil passing through the chamber 22, will be compelled to go from side to side of the annular chamber, around the hot walls 21 of the chamber 25 and thus become highly heated. The baffles 22^a likewise become heated by conduction and assist in raising the temperature of the air and fuel, and to increase this capacity, each

baffle is provided with a number of ribs 22^c on each side, extending perpendicularly from the baffles, in such positions and to such distances that the ribs on adjacent faces of the baffles overlap and thus render the course of the air and fuel still more circuitous and cause it to come into contact with greatly increased heating surface. The baffles 22^a are preferably mounted upon the inner cylindrical wall 21, before assembling with the wall 20. The heads 23, 24 will be secured to the cylindrical walls 20, 21 in any suitable manner to hold the parts properly assembled and if desired, packings may be used to allow for unequal expansion of the walls 20, 21, in case it be desired to so construct them that unequal expansion will take place. A portion of the annular chamber 22 near the discharge end thereof is supplied with a filtering medium 22^d preferably in the form of pieces of fractured material such as brick or the like, through which the heated fuel mixture must pass, with the effect of breaking up and still more finely dividing any particles of fuel that have not become vaporized. The filtering material 22^d is located where it will be highly heated so that not only does it not detract from the vaporizing effect of the fuel conditioning heater, but adds to that effect upon fuel passing through it.

The heads 23, 24 are preferably provided with annular chambers 23^a, 24^a extending part way around them and having at their ends ports 23^b, 24^b, in order to afford additional heating chambers in case it should be desired to heat the heavier fuel before admitting it to the mixing valve 9, or heat water (conveniently taken from the jacket of the engine) in case it should be desired to introduce water as a fuel element.

I claim:—

1. A heater for fuel internal combustion engines comprising an exhaust chamber and a fuel heating chamber having one wall in common and deflecting baffles in the fuel heating chamber comprising transverse barriers having openings to provide passageways alternately on opposite sides of the chamber and having longitudinal walls projecting from each transverse wall, toward an adjacent transverse wall, but terminating at points to leave passageways past the ends of the longitudinal walls.

2. A heater for fuel internal combustion engines comprising an exhaust chamber and a fuel heating chamber having one wall in common and deflecting baffles in the fuel heating chamber comprising transverse barriers having openings to provide passageways alternately on opposite sides of the chamber and having longitudinal walls projecting from each transverse wall, toward an adjacent transverse wall, but terminating at points to leave passageways past the ends of the longitudinal walls; said longitudinal walls on one transverse wall alternating in position with and projecting in between the longitudinal walls on the adjacent transverse wall.

The foregoing specification signed at Saratoga Springs, New York, this 7th day of August 1912.

CHARLES ALBERT JACOBSON.

In presence of two witnesses:
WM. S. OSTRANDER,
MARY K. LEONARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."