June 7, 1938. A. LUTZ 2,119,922

CARBURETOR

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Fig. 1.

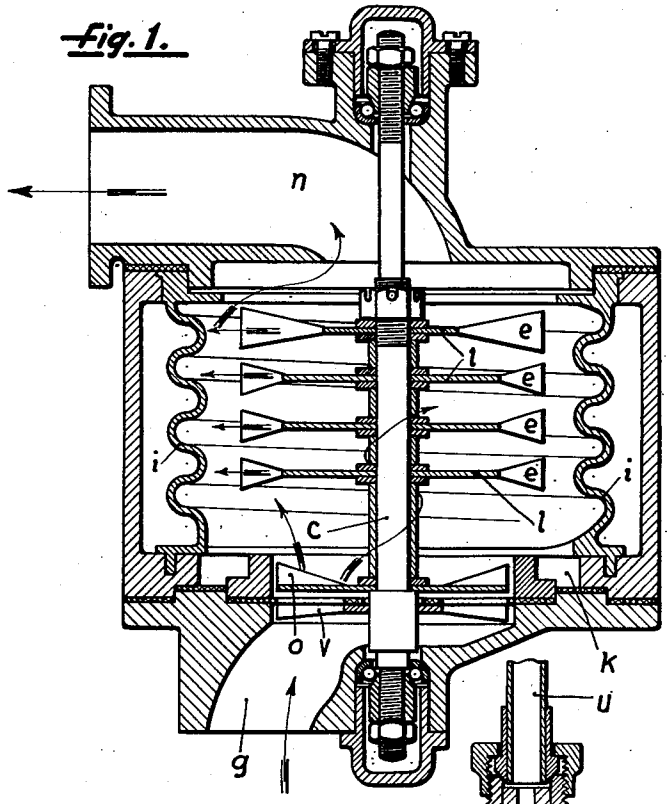
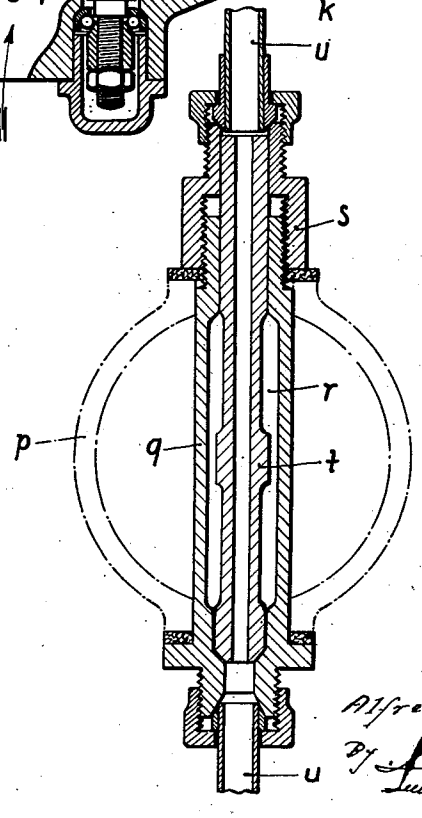


Fig. 2.



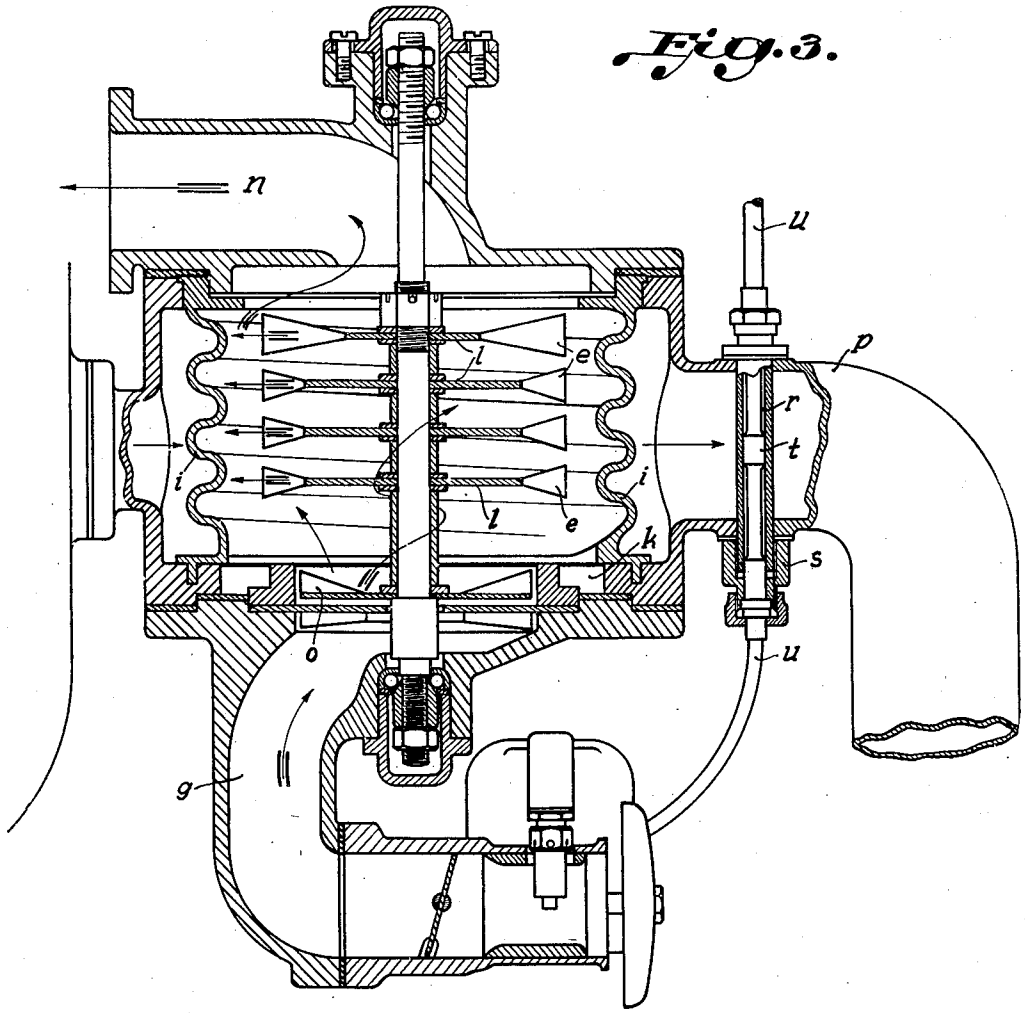
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Fig. 3.



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UNITED STATES PATENT OFFICE

2,119,922

CARBURETOR

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Application September 7, 1934, Serial No. 743,130
In Germany September 9, 1933

4 Claims. (Cl. 261—84)

This invention relates to a carburetor for producing from air and a suitable heavy fuel like crude oil a mixture adapted for use in internal combustion engines.

For vaporizing heavy oil as much as possible and mixing it thoroughly with air rotary channels or closed splash wheels throwing the fuel drops, onto heating surfaces have hitherto been employed. The vapor forms an intimate mixture with the drawn-in air, whereupon the mixture is drawn in by the engine. It has been found, however, that the output of the engine for which the fuel mixture is prepared in the manner described shows a considerable decrease, contrary to expectations, which is due to the fact that the engine must draw the mixture out of the splash wheel, i. e., considerable energy is required on the part of the engine to procure its gas mixture, whereby performance is unfavorably affected to an appreciable degree.

The invention proposes to eliminate this drawback by providing in the heating space an open splash wheel to act as a spraying wheel, from the vanes of which the fuel drops can detach themselves freely in a radial direction. Furthermore, the vanes of this splash wheel are preferably constructed so that they will suck in the air enriched by drops of fuel, throw it against the heating wall and then press the mixture down into a collector. In this way the vanes relieve the engine of the work of drawing the mixture of air and fuel out of the vane wheel, and the engine can procure the mixture from the collector without any consumption of power. The vanes of the splash wheel are bent or inclined so as to be capable of carrying out the three operations mentioned, namely, to exert a suction effect upon the air and drops of injected liquid, to throw them against the heating wall and to press the finished mixture into the collecting space. The splash wheel may be connected with a wind wheel which will be rotated by the suction effect of the engine and drive the splash wheel. A separate drive for the splash wheel is thus dispensed with to simplify the device.

To prevent drops of liquid from precipitating on the vanes near the axis of rotation, a receiving member is preferably disposed above this central portion for catching the fuel drops and leading them back to the vanes.

To increase the efficiency the heating surface or jacket may be corrugated or constructed in some other way so as to prevent the formation of a smooth area and thus increase the vaporizing surface. Vaporization itself can be increased by using a corrugated and spiral heating jacket to intensify the carburetion of the fuel mixture by the complete vaporization of the fuel in the depressions of the heating jacket. While in the spiral grooves the wet mixture cannot flow down without interruption as on a smooth surface, but is driven up again by the corresponding rotation of the splash wheels and thus vaporized.

To achieve perfect carburetion, a preheating member is arranged in front of the spray atomizing carburetor in which the heavy gas oils are preheated by the exhaust gases before they enter the vaporizing space, provision being made also for regulating the temperature of the fuel. For this purpose a preheating pipe passes transversely through the exhaust discharge pipe and forms therein a kind of heating chamber for the oil pipe passing through it. The passage is an insertable and exchangeable sleeve differing in width of bore for regulating the temperature of the fuel flowing through them according to their greater or lesser bore. Preheating of the heavy oil reduced the viscosity thereof, so that the speed at which it is discharged from the jets of the carburetor remains constant and uniform feeding of the engine is ensured.

By way of example, the invention is illustrated in the accompanying drawings, in which Figure 1 is an axial section of a carburetor; Fig. 2 is an axial section of the preheater; and Fig. 3 is an axial section of the carburetor and the preheater.

Referring to the drawings, the carburetor has an open splash wheel *e* disposed in a heating space and mounted on a main shaft *c*. The air mixed with drops of fuel passes through the suction piping to the splash wheel *e* which receives it and throws it against the heating jacket *i* heated by waste gas whereby vaporization is effected.

The heating jacket *i* is spirally corrugated, the winding extending in the direction of rotation of the splash wheel comprising a plurality of single wheels, so that the wet mixture flowing down in the grooves of the heating jacket *i* is continually driven up again.

The suction opening *g* is below, and the vaporized mixture flows through the channel *n* to the engine. Furthermore, on the shaft *c* of the splash wheel a driving wheel with vane rim is provided and causes rapid rotation of the splash wheel, owing to the suction of the engine and to the fact that by the position of the vanes of a guide wheel *v* firmly disposed underneath an ascending revolving motion is imparted to the suction current whereby the driving wheel *o* is ro-

tated. The drawn-in fuel is thus thoroughly mixed and atomized and passes from the wheel *o* to the splash wheels proper which throw it against the heating jacket *i*.

Fig. 2 shows a preheater for the gas oil. It is built into the exhaust pipe *p* and consists of a pipe *q* containing a heating space *r* and is held in position by the nut *s*. The fuel piping passes through the heating chamber *r* and comprises a steel tube *t* connecting with the usual copper pipings *u*, the opening of the tube *t* being so dimensioned that the rate of flow depending on the suction power of the engine will be increased and excess heating of the passing heavy oil prevented. According to the invention, inserted pipes *t* differing in width of bore are provided, and the fuel is heated corresponding to the greater or lesser width of bore of the inserted pipe *t*.

Fig. 3 shows the preheater in combination with the carburetor.

I claim as my invention:—

1. A heavy oil carburetor, comprising a rotatably mounted splash wheel having a plurality of closely-spaced vanes interconnected by a receiving member to guide any particles of fuel to the vanes, having a heating wall with corrugations succeeding each other in the direction towards the inlet end of said carburetor said corrugations surrounding the ends of the vanes, said vanes having surfaces which are approximately parallel to the direction of the axis of rotation of the wheel and the surfaces centrifugally and directly throwing the particles of oil radially against the heating wall, and means including the receiving member for positively leading the entire amount of fuel to the vanes of the splash wheel whereby all the particles will be caught and thrown by the vanes.

2. A heavy oil carburetor, comprising a rotatably mounted splash wheel having a plurality of closely-spaced vanes interconnected by a receiving member to guide any particles of fuel to the vanes, having a heating wall with helical corrugations succeeding each other in the direction towards the inlet end of said carburetor said helical corrugations surrounding the ends of the vanes, said vanes having surfaces which are approximately parallel to the direction of the axis of rotation of the wheel and the surfaces centrifugally and directly throwing the particles of oil radially against the heating wall, and means including the receiving member for positively leading the entire amount of fuel to the vanes of the splash wheel whereby all the particles will be caught and thrown by the vanes.

3. A heavy oil carburetor, comprising a rotatably mounted splash wheel having a plurality of closely-spaced vanes interconnected by a receiving member to guide any particles of fuel to the vanes, a heating wall surrounding the ends of the vanes, said vanes having surfaces which are approximately parallel to the direction of the axis of rotation of the wheel and the surfaces centrifugally and directly throwing the particles of oil radially against the heating wall, means including the receiving member for positively leading the entire amount of fuel to the vanes of the splash wheel whereby all the particles will be caught and thrown by the vanes; and a preheater for the heavy oil comprising a heating chamber arranged in the exhaust pipe of an engine served by the carburetor, an exchangeable tube extending through the heating chamber and having its opposite ends connected to the heavy oil supply pipe feeding the carburetor, the bore of said tube being smaller than that of the oil supply pipe.

4. A heavy oil carburetor, comprising a rotatably mounted splash wheel having a plurality of closely-spaced vanes interconnected by a receiving member to guide any particles of fuel to the vanes, a heating wall surrounding the ends of the vanes, said vanes having surfaces which are approximately parallel to the direction of the axis of rotation of the wheel and the surfaces centrifugally and directly throwing the particles of oil radially against the heating wall, means including the receiving member for positively leading the entire amount of fuel to the vanes of the splash wheel whereby all the particles will be caught and thrown by the vanes, and a wind wheel combined with the splash wheel to be rotated by engine suction.

ALFRED LUTZ.