F. W. BRADY.

CARBURETER.

APPLICATION FILED SEPT. 19, 1907.

957,731. **Patented May 10, 1910.**

2 SHEETS—SHEET 1.

Fig. 1.

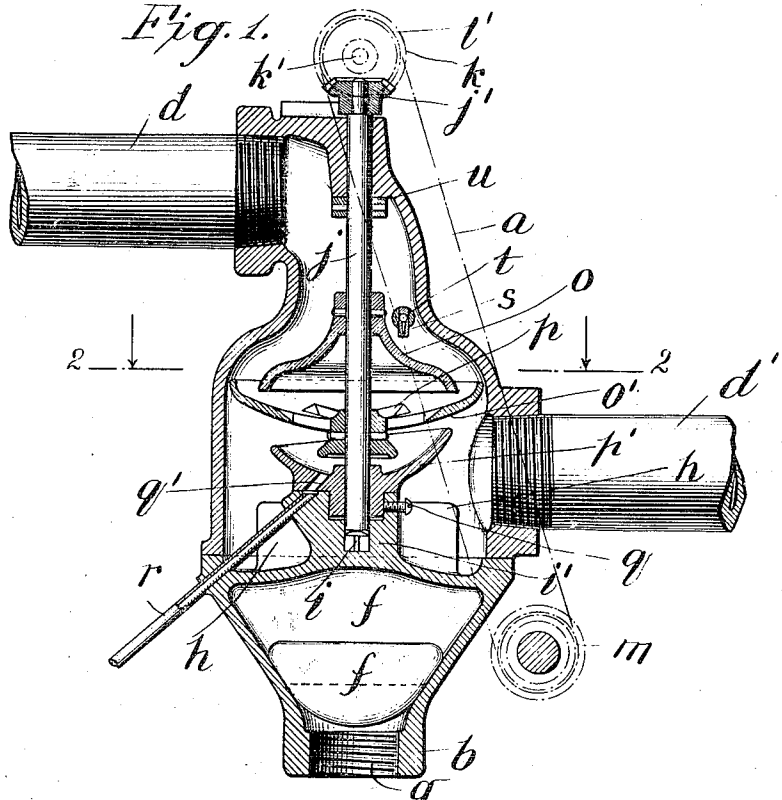
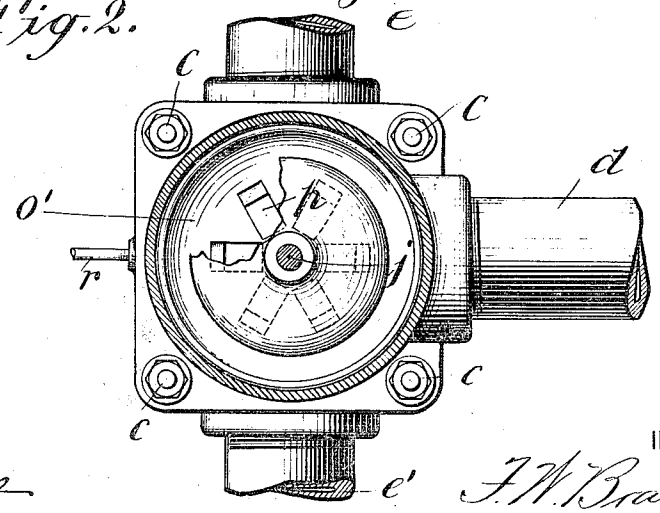


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

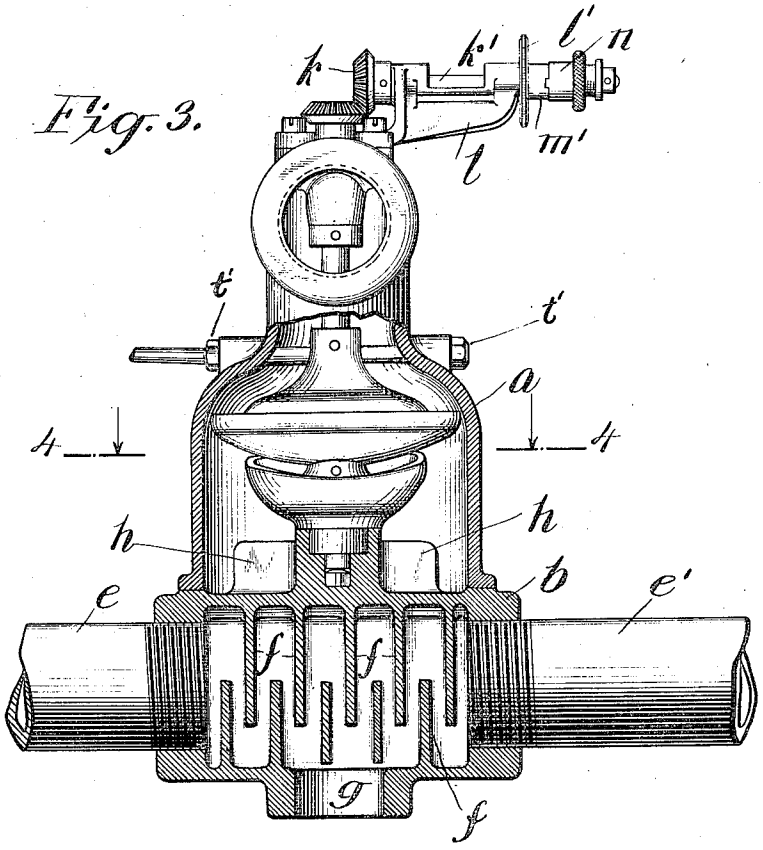
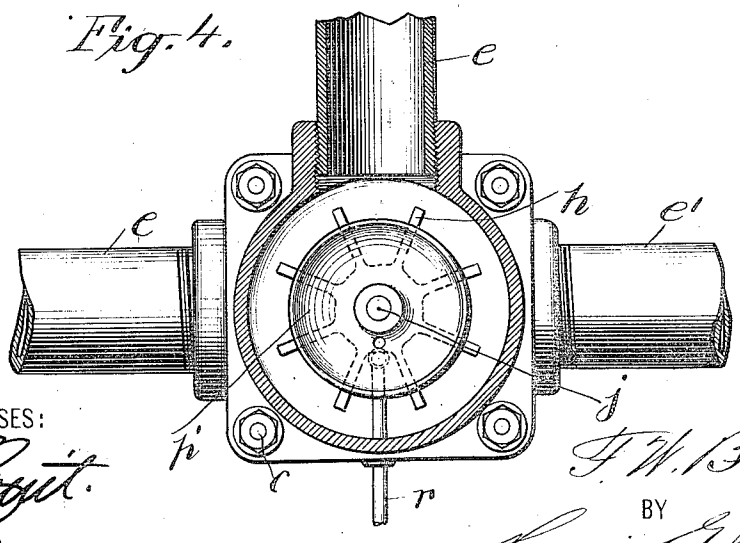


Fig. 4.



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CARBURETER.

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Application filed September 19, 1907. Serial No. 393,714.

To all whom it may concern:

Be it known that I, FRANCIS W. BRADY, a citizen of the United States, residing at New York, in the city, county, and State of New York, have invented certain new and useful Improvements in Carbureters; 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 particular object of my invention is to produce an improved carbureter for the heavier hydro-carbon oils, though a carbureter made in accordance with my invention may be used to advantage with any oil to be vaporized.

The construction and mode of operation of my improved carbureter will be understood from the following description when read in connection with the accompanying drawings in which the same reference characters are applied to like parts throughout.

In the drawings, Figure 1 is a central vertical section of my improved carbureter; Fig. 2 is a plan on the line 2—2 of Fig. 1; Fig. 3 is a section on a line at right angles to Fig. 1 and viewed from the left parts being shown in elevation; Fig. 4 is a plan on the line 4—4 of Fig. 3.

The main body of the carbureter is made up of the casings *a* and *b* secured together by the bolts *c*. The chamber *a* constitutes the vaporizing or carbureting chamber, into which air is introduced through the inlet pipe *d*, and from which the carbureted air is withdrawn through the outlet pipe *d'*. For the purpose of heating the carbureter the casing *b* has an inlet pipe *e* and an outlet pipe *e'* through which the products of combustion from an internal combustion engine or the like may be led. To increase the heating effect the interior of the casing *b* is formed with a series of baffle plates *f*, forming a tortuous passage for the heated gases. For the purpose of initially heating the carbureter there is an opening *g* through which any suitable heating medium, such for example as the flame from a gas burner, may be introduced. The upper surface of the casing *b* is provided with a series of radial projections *h* for the purpose of distributing the heat in the vaporizer.

The vaporizing surface *o* and the deflector *o'* of the carbureter are mounted for rapid rotation so that the oil fed thereon from the nozzle *s* may be spread evenly in a thin layer or film, and so taken up readily and freely by the passing air. To this end they are attached to vertical spindle *j* resting on end bearing *i* and extending through the upper end of casing *a*, and held from vertical movement by bearing-collar *u*. The spindle is driven in the specific embodiment shown from engine cam-shaft *m*, by a sprocket-chain (indicated in dotted lines) running over sprocket-wheel *l'* mounted on sleeve *m'* on stub-shaft *k'* journaled in bracket *l*. The sleeve *m'* may be clutched in driving connection with shaft *k'* by clutch-member *n*, which is screw-threaded on the end of stub-shaft *k'* and may be screwed back and forth to clutch and unclutch sleeve *m'* with shaft *k'*. When so clutched shaft *k'* drives bevel-gear *k* on its end, which in turn drives spindle *j* through bevel-gear *j'*.

Slightly below the air inlet pipe *d* the casing *a* has a flaring enlargement, and within this enlargement and secured to the spindle *j* by a transverse pin is the bell-shaped vaporizing surface *o*. This surface is so shaped that the passage between it and the flaring enlargement of the casing *a* is of substantially the same cross-section throughout. Beneath the vaporizing surface *o* and closely fitting the interior of the casing *a*, the deflector *o'* is secured to the spindle *j* by a transverse pin passing through its hub and through the spindle. The deflector has a series of openings *p* radiating from its center for the passage of the air, and is so positioned that it is above the outlet from the carbureter. Immediately beneath the deflector *o'* is a stationary drip-cup *p'*, the hub of which extends within the socket in the hub *i'* and is secured thereto by the set screw *q*. This cup *p'* is so shaped that the passage between its upper edge and the deflector *o'* is smaller on the side nearest the vapor outlet than on the side further removed from the vapor outlet, so that the air passing through the carbureter distributes itself throughout the enlarged heated chamber of the casing *a* and is thoroughly carbureted before it passes from the carbureter. The drip-cup *p'* has a drip-passage *q'* positioned to communicate with a drip-pipe *r* secured in the wall of the casing *b* and in the hub *i'*.

The hub of the deflector o' has a flaring boss at its lower end, and a boss at its upper end to prevent creeping of oil up the spindle, and similarly the cup p' has a raised boss on its hub for the same purpose.

Oil is fed onto the vaporizing surface o from the small nozzle s in the oil pipe t which passes through the walls of the casing a above the vaporizing surface and is secured in position by nuts t', as shown in Fig. 3, so that when the nuts are loosened it may be turned on its own axis, thereby changing the direction of the nozzle s and varying the amount of vaporizing surface upon which the oil is fed. By this means the amount of oil vaporized on the surface o may be varied.

The operation is as follows:—The carbureter is initially heated, if the heavier hydro-carbon oils are used, through the opening g. Thereupon the sprocket l' is clutched to the shaft k' and the spindle j is set into rotation. Thereupon the oil pipe is opened allowing oil to flow through the nozzle s onto the rotating vaporizing surface o, on which the oil is spread in a thin film. Air is drawn into the engine, or into a storage reservoir for the carbureter mixture, through the inlet pipe d, the casing a and the out-take pipe d'. The air passes downwardly over the vaporizing surface o against the deflector o', and owing to the close fit of the deflector within the casing a substantially all of the air passes through the openings p and owing to the peculiar shape of the cup p' the air is forced to circulate within the lower enlarged chamber portion of the casing a in contact with the radial ribs h before it passes into the pipe d'. An intimate mixture is thus effected between the air and the vapor arising from the oil spread on the vaporizing surface. After the engine is under way the heat of the carbureter is maintained by the exhaust gases passing through the casing b. When easily volatilized hydro-carbon oils are used it will be unnecessary to heat the carbureter and in such case the casing b may be dispensed with and any other suitable inclosure for the lower casing a containing a support for the spindle j may be substituted.

The foregoing is a description of the preferred form of my invention, but it will be seen that its nature is such that the principles and mode of operation of it may be embodied more or less completely in other equivalent structures utilizing a part or all of the improved features.

What I claim is:—

1. A carbureter comprising a carbureting chamber and a vaporizing member rotatably mounted therein, said chamber having an air inlet port above the vaporizing member and a vapor out-take port below the vaporizing member, in combination with means for feeding a stream of oil on the upper surface of the vaporizing member, and mechanism for rotating said member to spread the oil thereon in a thin film, whereby the air is caused to pass directly across the film of oil on the vaporizing surface; substantially as described.

2. A carbureter comprising a casing having a contracted end and an enlarged chamber, connected by a flaring portion, an air inlet in the contracted end and a vapor out-take from the enlarged chamber, a spindle extending through the casing axially of the flaring portion, a bell-shaped vaporizing surface mounted on the spindle in the flaring portion, means for feeding oil onto the vaporizing surface, and mechanism for rotating the spindle and with it the vaporizing surface; substantially as described.

3. A carbureter comprising a carbureting chamber and a vaporizing member rotatably mounted therein, said chamber having an air inlet port above the vaporizing member and a vapor out-take port below the vaporizing member, and a baffle having a central passage and substantially dividing the chamber between the vaporizing member, and the vapor out-take port, in combination with means for feeding a stream of oil on the upper surface of the vaporizing member and mechanism for rotating said member to spread the oil thereon in a thin film, whereby the air is caused to pass directly across the film of oil on the vaporizing surface and in a tortuous path through the central passage in the baffle; substantially as described.

4. A carbureter comprising a carbureting chamber and a vaporizing member rotatably mounted therein, said member having an air inlet port above the vaporizing member and a vapor out-take port below the vaporizing member, in combination with means for feeding a stream of oil onto the upper surface of the vaporizing member, mechanism for rotating said member to spread the oil thereon in a thin film, a drip cup below the vaporizing member to catch any oil that drips therefrom, and a drainage pipe leading from the drip cup to the exterior of the carbureting chamber, whereby the air is caused to pass directly across the film of oil on the vaporizing surface and the accumulation of oil in the chamber is prevented; substantially as described.

5. A carbureter comprising a carbureting chamber and a vaporizing member rotatably mounted therein, said chamber having an air inlet port above the vaporizing member, and a vapor out-take port below the vaporizing member, and a baffle having a concave upper surface with a central passage and substantially dividing the chamber between the vaporizing member and the vapor out-take port, in combination with means for feeding a stream of oil onto the upper surface of the vaporizing member, mechanism for

rotating said member to spread the oil thereon in a thin film, a drip cup below the baffle to catch any oil that drips therefrom, and a drainage pipe leading from the drip cup to the exterior of the carbureting chamber, whereby the air is caused to pass directly across the film of oil on the vaporizing surface and by a tortuous path through the central passage of the baffle, and the accumulation of oil in the chamber is prevented; substantially as described.

6. A carbureter comprising a casing having a contracted end and an enlarged chamber connected by a flaring portion, an air inlet in the contracted end and a vapor outtake from the enlarged chamber, a spindle extending through the casing axially of the flaring portion, a bell-shaped vaporizing surface mounted on the spindle in the flaring portion, a baffle having central passages, surrounding the spindle between the vaporizing surface and the out-take and substantially fitting the casing, means for feeding oil onto the vaporizing surface, and means for rotating the spindle and with it the vaporizing surface; substantially as described.

7. A carbureter comprising a casing having a contracted end and an enlarged chamber connected by a flaring portion, an air inlet in the contracted end and a vapor outtake from the enlarged chamber, a spindle extending through the chamber axially of the flaring portion, a bell-shaped vaporizing surface mounted on the spindle in the flaring portion, a baffle having central passages secured to the spindle between the vaporizing surface and the out-take and substantially fitting the casing, means for feeding oil onto the vaporizing surface and means for rotating the spindle and with it the vaporizing surface and baffle; substantially as described.

8. A carbureter comprising a casing having a contracted upper end and an enlarged chamber at its lower end connected by an intermediate flaring portion, an air inlet in the contracted end and a vapor out-take from one side of the enlarged chamber, a vertical spindle extending through the casing axially of the flaring portion, a bell-shaped vaporizing surface mounted on the spindle in the flaring portion, a baffle, having central passages surrounding the spindle below the vaporizing surface and substantially fitting the casing, a drip-cup below the baffle and having its edge so shaped that it gradually approaches the baffle on the side nearest the outlet, means for feeding oil onto the vaporizing surface and means for rotating the spindle and with it the vaporizing surface; substantially as described.

9. A carbureter comprising a chamber having an air inlet port and a vapor outtake port, a rotatable vaporizing surface interposed in said chamber between the ports, means for feeding oil onto the vaporizing surface, and mechanism for rotating the surface, in combination with means for heating the chamber comprising a casing closing the bottom thereof and containing a passage for heated gases; substantially as described.

10. A carbureter comprising a chamber having an air inlet port and a vapor outtake port, a rotatable vaporizing surface interposed in said chamber between the ports, means for feeding oil onto the vaporizing surface, and mechanism for rotating the surface, in combination with means for heating the chamber comprising a casing closing the bottom thereof and containing a passage for heated gases and heat radiating ribs extending into the said chamber; substantially as described.

11. A carbureter comprising a chamber having an air inlet port and a vapor outtake port, a rotatable vaporizing surface interposed in said chamber between the ports, means for feeding oil onto the vaporizing surface, and mechanism for rotating the surface, in combination with means for heating the chamber comprising a casing closing the bottom thereof and having an opening for admission of a heating medium; substantially as described.

12. A carbureter comprising a casing having a contracted upper end and an enlarged chamber at its lower end connected by an intermediate flaring portion, an air inlet in the contracted end and a vapor out-take from one side of the enlarged chamber, a vertical spindle extending through the casing axially of the flaring portion, a bell-shaped vaporizing surface mounted on the spindle in the flaring portion, a baffle, having central passages surrounding the spindle below the vaporizing surface and substantially fitting the casing, a drip-cup below the baffle and having its edge so shaped that it gradually approaches the baffle on the side nearest the outlet, means for feeding oil onto the vaporizing surface, and means for rotating the spindle and with it the vaporizing surface, in combination with a second casing closing the bottom of the aforesaid casing and serving as a support for the spindle, and provided on its upper surface with heat-radiating ribs, and having a passage for heated gases; substantially as described.

13. A carbureter comprising a chamber having an air inlet port and a vapor outtake port, a rotatable vaporizing surface interposed in said chamber between the ports, and an adjustably mounted oil feed pipe extending into said chamber and carrying a nozzle directed toward the vaporizing surface, whereby the direction of the nozzle may be changed to vary the extent of vaporizing surface upon which the oil is fed; substantially as described.

14. A carbureter comprising a casing having an air inlet port and a vapor out-take

port, a rotatably mounted, bell-shaped vaporizing surface in said chamber, an oil feed pipe extending into said chamber and carrying a laterally projecting nozzle directed toward the vaporizing surface, said pipe being rotatable on its own axis to change the direction of the nozzle and thereby vary the extent of vaporizing surface upon which the oil is fed; substantially as described.

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

FRANCIS W. BRADY.

Witnesses:

HOWARD E. JOHNSON,

L. C. MOORE.