

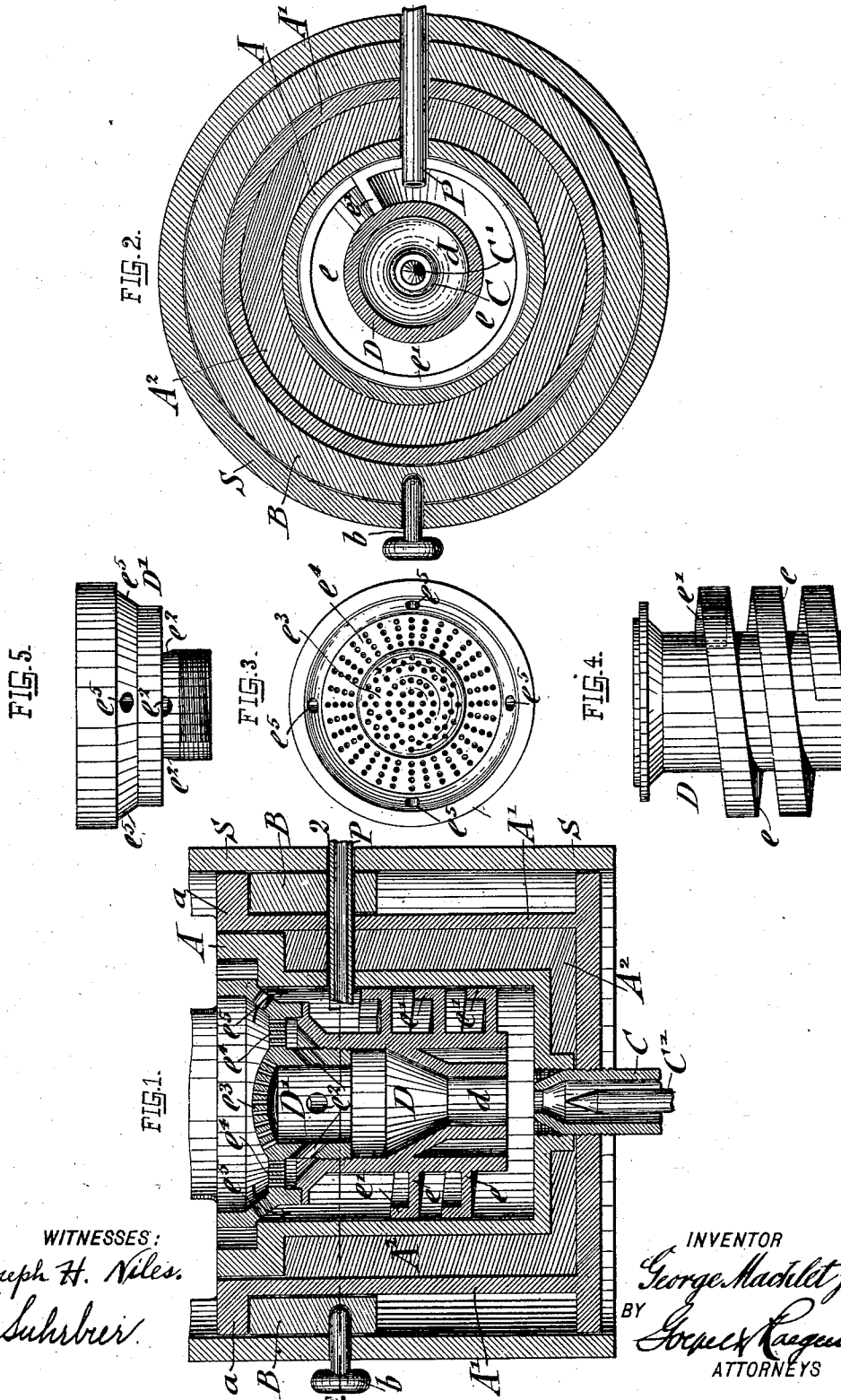
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G. MACHLET, JR.
BURNER FOR CARBURETING MACHINES.

(Application filed Feb. 8, 1901.)

(No Model.)



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GEORGE MACHLET, JR., OF ELIZABETH, NEW JERSEY.

BURNER FOR CARBURETING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 687,535, dated November 26, 1901.

Application filed February 8, 1901. Serial No. 46,508. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MACHLET, JR., a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Burners for Carbureting-Machines, of which the following is a specification.

This invention relates to an improved burner for carbureters and other applications which has the advantage that its main part is made in one whole casting and which can be started by supplying a lighter hydrocarbon until the proper heat in the burner is developed, when the petroleum or other heavy hydrocarbon to be used can be supplied to the same for continuing the flame; and the invention consists of a burner for carbureting-machines which comprises a jacketed casing provided at its lower part with a nozzle provided with a needle-valve for supplying air under pressure; a cylindrical burner-body at the inside of the casing provided with a helical channel extending around the main portion of the same, said burner-body being hollow, so as to form a mixing-chamber at the interior of the same, in which the hydrocarbon vapors and air under pressure are mixed; a top portion or head provided with a central perforated portion and a ring-shaped exterior portion; inclined channels for connecting the mixing-chamber with the perforated ring-shaped portion, and channels above such ring-shaped portion for connecting the space between the burner-body and jacketed casing with the space above the head, so as to draw down the jets for producing the vaporization of the hydrocarbon in the space between the convolutions of the helical channel.

The invention consists, further, of certain details of construction and combinations of parts, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a vertical central section of my improved burner for carbureting-machines. Fig. 2 is a horizontal section of the same on line 2-2, Fig. 1. Fig. 3 is a top view of the head of the burner-body; and Figs. 4 and 5 are respectively a side elevation of the lower part and of the upper part of the burner-body detached from the inclosing casing.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the cylindrical casing of my improved burner for carbureting-machines. The casing A is provided with an exterior jacket A', between which and the casing A is interposed a refractory lining A² of non-conducting material, such as asbestos, fire-brick, or other suitable material. The jacket A' is provided with a cylindrical flange *a* at its upper end, so as to be supported in the casing or mantle S of the machine with which the burner is to be used by means of a supporting-ring B, that is held in position by a locking-pin *b*, and the supply-pipe P for the hydrocarbon that is supplied to the burner.

The lower part of the casing A is provided with a central screw-threaded opening, into which is screwed a nozzle C, which is provided with a tapering mouthpiece, the nozzle being opened or closed by means of an adjustable needle-valve C'. The nozzle C is connected with a suitable supply of air under pressure, said supply being regulated by the needle-valve C'.

The burner-body is made of two parts D D', each being made in one casting. The lower part D is made cylindrical in shape and provided with a contracted throat *d* at its lower portion, said contracted portion *d* being in line with the supply-nozzle C. Around the lower cylindrical part of the burner is arranged a helical channel *e*, provided with an exterior flange *e'*, which channel is cast integral with the lower part, the upper part of said helical channel being below the supply-pipe for the hydrocarbon, so that the latter shall deliver into the same. The upper part of the portion D of the burner-body is made outwardly flaring and provided with a seat on which the upper part or head D' is supported. The head D' is provided with a downwardly-extending cylindrical center portion having an exterior screw-thread engaging an interior screw-thread in the upper part of the lower portion D, so that the parts D D' are firmly connected together, an annular rim of the top part resting on a circumferential seat of the flaring portion of the lower part. The central cylindrical portion of the head forms with the portion of the lower part

D into which it is screwed a mixing-chamber, in which the air under pressure is mixed in the proper proportions with the vapors of the hydrocarbon supplied to the burner. The gas and air mixture is then conducted through inclined channels e^2 in the downwardly-extending central portion of the head into the annular space formed by the flaring portion of the lower part D, as shown in Fig. 1.

The central top part e^3 of the head is preferably made convex and is provided with a number of jet-openings, through which the combustible gas and air mixture is forced under pressure, so as to be burned in the combustion-chamber above the burner. The perforated central portion is surrounded by an annular perforated portion e^4 , through which the combined combustible gas and air mixture is supplied by the inclined channels.

The head D' is provided with an outwardly-flaring portion, in which are arranged supply-openings e^5 , through which the hot products of combustion are drawn in downward direction into the annular space between the burner-body D D' and its casing A, as indicated by arrows in Fig. 1. The hot products of combustion pass from the annular space through the spiral passage formed by the helical channel e in downward direction, being sucked in by the movement of the air under pressure supplied by the nozzle until they are brought within range of the blast and are forced into the mixing-chamber in the burner and again out through the jets in the portion e^3 into the combustion-chamber. The upper flaring part of the head is seated on a shoulder of the casing A, as shown in Fig. 1, so that the burner-body is supported always in proper position relatively to the air-supply nozzle. The flange e' at the outer edge of the helical channel fits closely to the inner surface of the casing A, so as to produce the proper course of the hot vapors drawn in over the same.

For heating up the burner preparatory to supplying the heavy hydrocarbon, such as petroleum for which the burner is adapted, a lighter hydrocarbon, such as naphtha, is supplied through pipe P to the helical channel and is vaporized by the air supplied under pressure by the nozzle, the combined air and gas mixture passing out the jets in the part e^3 , where it can be readily lighted. The walls of the burner are heated up by the heat of combustion, so that the vaporization of the light hydrocarbon is now quickly accomplished as the same passes over the heated surface of the helical channel. The vapors are mixed in the space between the lower part D and the casing A, with the air supplied by the nozzle completely mixed in the mixing-chamber at the interior of the burner and emitted through the openings at the central portion e^3 and the annular portion e^4 and burned. The heated products of combustion are drawn through the openings e^5 into the annular space between the burner-body and

the casing A and over the surface of the hydrocarbon upon the helical channel e to the lower part, so that thereby the vaporization of the hydrocarbon and thorough mixing of the same with the air under pressure are accomplished. The central portion of the head serves for producing the heating-flame for the carbureter, while the heat produced by the jets of the annular portion e^4 are used for vaporizing the hydrocarbon preparatory to the mixing of the same with the air under pressure supplied by the nozzle. As soon as the burner is properly heated up by the burning of the mixture of compressed air with the vapors of the light hydrocarbon the supply of the latter is interrupted and the heavier hydrocarbon, such as petroleum, is then supplied through pipe P and vaporized in a similar manner, mixed with the air under pressure in the mixing-chamber at the interior of the burner-body, and burned at the central portion e^3 of the burner, while the vaporization of the petroleum is accomplished by the heated products of combustion drawn into the space between the burner-body and casing, as described.

My improved hydrocarbon-burner has the advantage that its main parts can be made of durable cast metal, which are but little subject to wear; second, that the vaporization of the liquid hydrocarbon supplied to the burner is accomplished in a very effective manner on its way to the mixing-chamber, and, third, that the mixing of the hydrocarbon vapors with the air under pressure is accomplished at the interior of the burner-body, so that a continuous supply of combustible air and gas mixture is supplied to the jets, and thereby a very effective combustion produced.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A burner for liquid hydrocarbons, consisting of a jacketed casing, and a burner-body in said casing, said burner-body being located so as to form with the casing an annular space, and being composed of a lower portion provided with a helical channel for the liquid hydrocarbon, a valved nozzle slightly below and in line with the center of the burner-body, said burner-body having a passage therethrough and forming a mixing-chamber, and said annular space communicating therewith, and a head provided with central jet-openings and an annular perforated portion, and with channels connecting said perforated portion with the interior of the burner-body, and with openings connecting the space above the head with the annular space between the burner-body and the casing, substantially as set forth.

2. A burner for liquid hydrocarbons, consisting of a cylindrical casing, a valved air-supply nozzle at the lower part of the same, and a burner-body in line with said air-supply nozzle, said burner-body being located in the casing, and forming with the same an an-

nular space, and being composed of two parts, a lower cylindrical portion having an interior contracted throat, and forming a mixing-chamber communicating with said annular space, and an exterior helical channel, and an upper top part or head provided with central jet-openings and with an annular perforated portion, said head being provided with inclined channels for supplying the hot gases of combustion to said annular space, substantially as set forth.

3. In a burner for liquid hydrocarbons, a casing containing a burner-body comprising two main portions, a lower portion having an interior contracted throat, an exterior helical channel integral therewith and an outwardly-flaring upper part, and a top portion or head seated on the flaring portion and screwed

into the upper part of said lower portion of the burner-body, said head being provided with central jet-openings and an annular perforated part surrounding the same, and with inclined openings forming channels communicating with the interior of said interior contracted throat and with perforations in said annular part of the head, and an outwardly-flaring upper part having apertures in the flaring part thereof forming air-supply openings, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

GEORGE MACHLET, JR.

Witnesses:

PAUL GOEPEL,
JOSEPH H. NILES.