J. K. STEWART.

CARBURETER.

APPLICATION FILED JULY 27, 1911.

1,046,344.

Patented Dec. 3, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

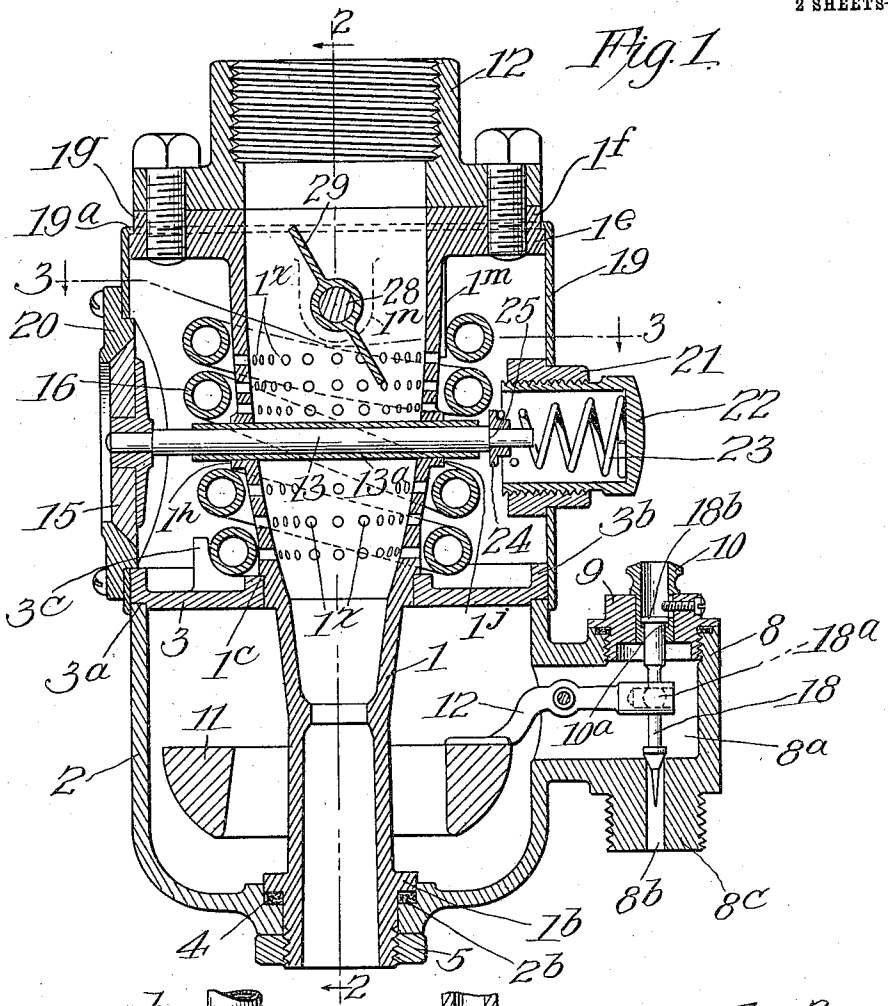
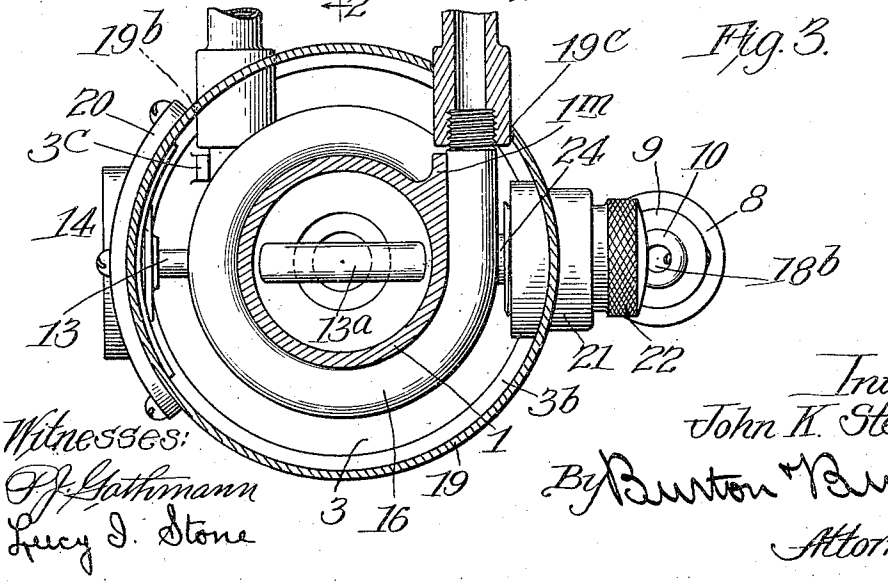


Fig. 3.



Witnesses:
P. J. Gathmann
Lucy D. Stone

Inventor:
John K. Stewart
By Burton & Burton
Attorneys:

J. K. STEWART.

CARBURETER.

APPLICATION FILED JULY 27, 1911.

1,046,344.

Patented Dec. 3, 1912.

2 SHEETS—SHEET 2.

Fig. 2.

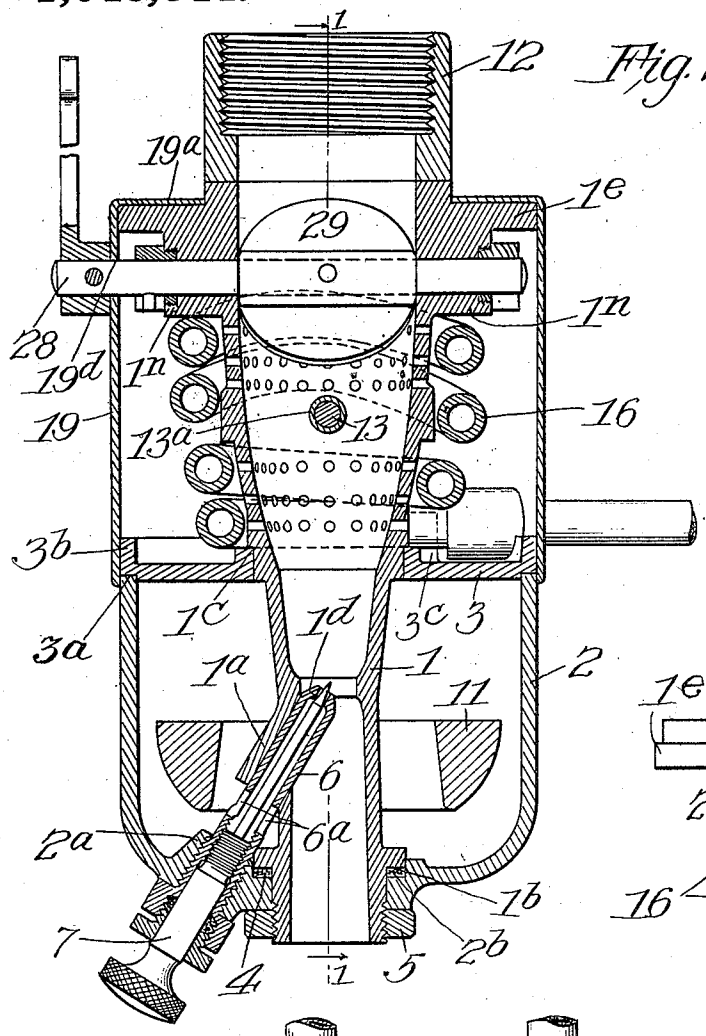


Fig. 5.

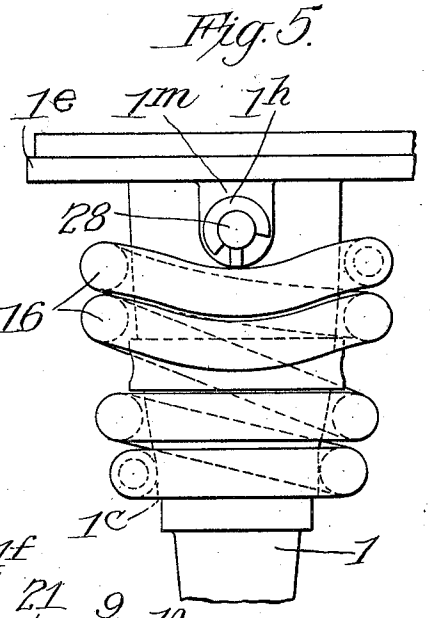
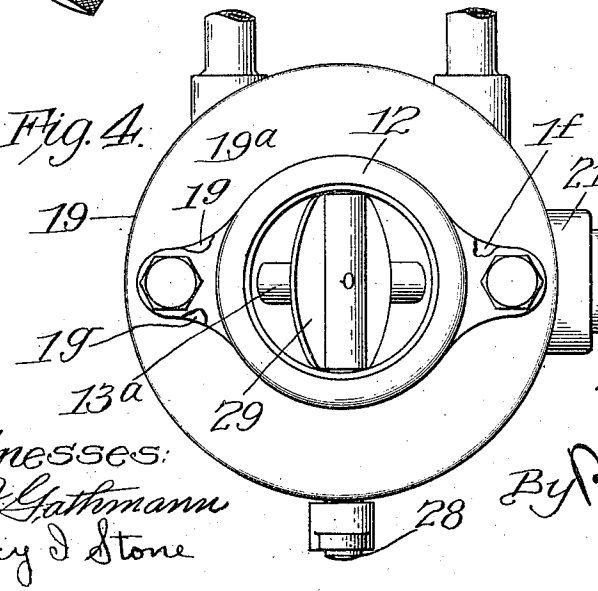


Fig. 4.



Witnesses:
F. J. Gathmann
Lucy D. Stone

Inventor:
John K. Stewart.
By Burton & Burton
Attorneys:

UNITED STATES PATENT OFFICE.

JOHN K. STEWART, OF CHICAGO, ILLINOIS.

CARBURETER.

1,046,344. Specification of Letters Patent. Patented Dec. 3, 1912.

Application filed July 27, 1911. Serial No. 640,749.

To all whom it may concern:

Be it known that I, JOHN K. STEWART, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Carbureters, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide a carbureter, improved with respect to the compactness of structure, simplicity in outline and ease of manufacture, over those heretofore commonly in use.

It consists in the elements and features of construction shown and described in the drawings as indicated in the claims.

In the drawings:—Figure 1 is an axial section of a device embodying this invention, section being at the line 1—1, on Fig. 2. Fig. 2 is a section at the line 2—2, on Fig. 1. Fig. 3 is a section at the line 3—3, on Fig. 1. Fig. 4 is a top plan view. Fig. 5 is a side elevation of the upper portion of the interior element of the device.

The details of construction of the carbureter shown in the drawings are devised chiefly with a view to producing as simple and smooth an outline and as compact a structure as possible with the minimum of members protruding materially beyond the main outlines of the casing and body, and also adapted to have its parts assembled and secured together in the easiest manner and with the most easily formed joints. Also the several parts are designed with special reference to producing them in steel dies so that they may be reproduced in finished form substantially without machining. To accomplish these several ends, the structure comprises an axially-extending tubular member, 1, open at both ends and having nearer one end than the other a boss, 1^a, positioned obliquely to the axis, and apertured obliquely to the axis of the said member, 1, for the purpose of seating, as hereinafter explained. an oil inlet nozzle. The central member has exterior shoulders, 1^b, and 1^c, the outer diameter of the first being shown slightly less than the inner diameter of the second shoulder, said shoulders both facing toward the smaller end of the central member and designed for seating, respectively, the oil cup or reservoir, 2, and a partition plate, 3, which forms the cap of said oil cup, said oil cup being centrally apertured at the bottom to fit the exterior of the said smaller end of the said central member, 1, below the shoulder, 1^b, and having inwardly facing seat, 2^b, around its said aperture to face said shoulder, 1^c, packing gasket, 4, being interposed. The cap, 3, is centrally apertured to fit the cylindrical seat provided for it just below the shoulder, 1^c, and is stopped on said shoulder; and said cap is also marginally rabbeted on the under side at 3^a to seat the upper end of the cup, 2. The member, 1, protrudes below the cup and is exteriorly threaded for a clamping nut, 5, by which the cup and its cap are both bound tightly together and onto said central member, 1. The cup, 2, has at its lower end an oblique boss, 2^a, obliquely apertured and alined axially with the boss, 1^a, but having its inner end spaced from the outer end of the boss, 1^a. The oil inlet nozzle, 6, is inserted through the alined apertures of the cup and central member, protruding into the axial chamber of the latter, the boss, 2^a, being interiorly threaded and the nozzle being exteriorly threaded at its base for screwing into the cup while its upper extremity makes a practical drive fit in the axial aperture of the boss, 1^a. The said nozzle has apertures, 6^a, at positions in its length which will cause them to be exposed between the proximate ends of the bosses, 1^a and 2^a, for admitting oil from the cup to the nozzle chamber. A needle valve, 7, having its stem screwed into the base of the nozzle, controls the discharge passage from the upper end thereof, which is positioned at a reduced throat-way, 1^d, in the axial chamber of the central member, 1. The cup, 2, has an integrally offset supply valve chamber, 8, whose cavity, 8^a, is formed radially with respect to the cup and communicates with the cavity of the latter. This valve chamber has at its lower side an inlet passage, 8^b, extending out through a downwardly protruding and exteriorly threaded boss, 8^c, designed to afford attachment for the oil pipe, (not shown) through which oil is supplied through the duct, 8^b, which is controlled by a vertically positioned valve, 18, whose stem extends up into an axially apertured plug, 9, set into the upper end of the chamber, 8, in which there is provided a lifter and guide, 10, for the upper end

of said stem. The float, 11, in the cup, 2, has a lever arm, 12, fulcrumed in the neck or passage from the cup chamber to the supply valve chamber, and forked for engagement with a spherical boss, 18^a, on the valve stem, so that the rising and falling of the float will close and open the valve for controlling the height to which the oil can rise in the cup, with the purpose of causing the normal level to be at all times slightly below the terminal of the inlet nozzle, 6.

The central member, 1, has near its upper end a horizontal flange, 1^e, and at its upper end at opposite sides it has lugs, 1^f and 1^g, for receiving a similarly formed coupling, 12, which is suitably threaded for attachment to the pipe leading to the engine to be served by the carbureter. Intermediate the shoulder 1^e which stops the cap, 3, of the cup, and the flange, 1^e, the central member, 1, has horizontally protruding bosses, 1^h and 1^j, in diametrically opposite positions, which are apertured in line with each other for receiving with a drive fit a sleeve, 13^a, to seat and guide a valve stem, 13 of an air inlet valve, 14, whose seat and controlling spring are provided and accommodated as hereinafter explained. A heating coil, 16, encompasses the central member, 1, above the cup, 3, and below the flange, 1^e. The two ends of the pipe forming this coil, extend off at the top and bottom of the coil, tangentially with respect to the coil and parallel to each other. The in-leading end, which is the lower end is lodged upon the cap, 3, and positioned angularly about the axis of the central member by a boss, 3^c, which projects up from the said cap. The out-leading end at the top is snugly seated under the boss, 1^n, and is similarly positioned angularly about the axis by a downwardly projecting lug, 1^m. Both terminals of the coil end within a cylindrical shell, 19, whose lower end fits about the peripheral flange, 3^b, of the cap, 3, and whose upper end has an annular in-turned flange, 19^a, which is stopped upon the exterior upper margin of the flange, 1^e, thereby inclosing an annular chamber in which the heating coil, 16, is positioned, as described, around the central member. At one side the shell, 19, has a circular aperture for receiving the seat, 20, for the valve, 15, and at a diametrically opposite position it has a smaller aperture for receiving a nipple, 21, whose purpose is to hold the hollow cap nut, 22, which forms a chamber and adjusting means for a spring, 23, which is lodged in said hollow adjusting nut and stopped at one end under the head thereof, the other end being lodged upon a collar, 24, which is passed on to the stem, 13, which protrudes axially within the chamber of said adjusting nut, and has a shoulder, 25, for stopping said collar. The parts described which are mounted on the shell, 19, are introduced after the shell is in position, the fitting, 21, being first entered through the aperture which ultimately receives the valve seat, passed in around the heating coil and inserted outwardly into the aperture provided for it, wherein it is stopped by the outwardly-facing shoulder with which it is provided seating on the inner margin of said aperture. The valve, 13, having its stem properly secured to it, is next inserted through the sleeve, 13^a, extending as described, across the central member, 1. The collar, 24, is then passed on to the stem to the shoulder mentioned. The spring follows it and the adjusting cap nut, 22, is then screwed into place against the end of the spring. The valve seat, 20, may now be inserted in place and secured by screws. To accommodate the sleeve, 13^a, for the valve stem, 13, the heating coil is distorted, as seen in Fig. 5, to open way between the second and third coils from the bottom for said sleeve and stem. This causes or permits the form of the upper coils to be as seen in Fig. 5,—that is, depressed in a vertical plane transverse to that at which said sleeve and stem stand; and this depression affords opportunity for the mounting in proper position of the stem, 28, of a butterfly valve, 29, proper bosses, 1^n, to afford bearings for such stem being formed on the under side of the flange, 1^e, of the member, 1. This butterfly valve is introduced into the upper end of the axial cavity of the member, 1, after all the other parts described are in position and the valve stem is then inserted through the shell which is apertured on one side for that purpose, passed through the bearings, 1^n and intermediately through the lugs provided for it on the valve, and secured in place by pinning the valve to it as shown.

The cylindrical shell, 19, beside the apertures described for receiving the valve, 20, and the fitting, 21, has apertures, 19^b and 19^c, opposite the inlet and exit ends of the coil, 16, of suitable size to admit a pipe connection for coupling onto the said two ends of the coil, and it is also apertured at 19^d, for the stem, 28, of the butterfly valve, but these apertures are substantially closed by the parts protruding through them, as described, so that said shell constitutes an air chamber around the heating coil, to which the admission of air is controlled substantially by the valve, 14. The purpose of this valve, it will be understood, is to furnish a supplemental supply of air in addition to air which will be drawn through the lower end of the central member, 1, for mixing with the oil which will be sucked in at the same time through the oil nozzle constituting the primary charges. It is desirable that this supplemental air supply entering through the valve, 14, and which is to be

heated by the coil before mixing with the primary oil and air charge which is passing through the axial chamber of the member, 1, should be thoroughly broken up so as to be mixed as uniformly as possible with said primary charge; and for this purpose, the member, 1, is perforated as shown, with a multiplicity of small apertures, 1^x, distributed over the portion of its surface encompassed by the coil, so that the air drawn in through the coil is delivered in a multiplicity of small jets or streams into the primary charge.

It will be understood that the cap nut, 22, will be adjusted to tension the spring, 23, so as to control the degree of opening of the valve, 14, and thereby regulate the quantity of air which will be drawn in through said passage valve, 14, by the suction of the engine.

The lifter, 10, for the valve, 18, is adapted for its purpose of lifting the valve at will by the structure of the valve stem, which for that purpose has a flange, 18^b, at its upper end which seats on a shoulder, 10^a, on the inner wall of said lifter, which is bored axially to form a guide for the stem, and counter-bored from the upper end to form said shoulder. It will be understood that the purpose of this construction is to enable the operator to momentarily lift the valve and admit an exceptional charge of oil, as is sometimes desirable in starting.

I claim:—

1. A carbureter comprising an oil chamber; an air chamber; means for heating the air in the air chamber, and a conduit into which the oil and heated air are separately discharged from said chambers respectively; said chambers being positioned end to end, and the conduit being a stem which is hollow from end to end and which extends through both chambers for securing them together and communicating with both of them.

2. A carbureter comprising an air chamber and an oil chamber which are both substantially cylindrical and positioned end to end; means for heating the air in the air chamber; a conduit into which the oil and heated air are separately discharged from said chambers respectively, said conduit being a tubular stem axially positioned with respect to the two chambers and open from end to end; a partition plate between said chambers lodged upon the upper end of the oil chamber, said tubular stem having a shoulder which stops upon the upper side of said partition plate for binding said plate upon the oil chamber, and having its lower end protruding from the bottom of the oil chamber and exteriorly threaded for receiving a nut for binding the oil chamber up against the under side of the partition plate.

3. A carbureter comprising an oil chamber and an air chamber both of which are substantially cylindrical in form and which are positioned end to end; a conduit which extends through both said chambers, and into which oil and heated air are discharged separately from them respectively; a partition plate between said chambers stopped upon the top of the oil chamber, said conduit having at one end a flange which forms the top of the air chamber, and having two stop shoulders facing toward the other end, one of said stop shoulders being relatively remote from, and the other relatively near to said other end, for stopping respectively upon the partition plate and upon the bottom of the oil chamber; a heating coil encompassing said conduit within the air chamber and having its two ends stopped on said partition plate and said flange, respectively; the conduit being protruded below the oil chamber and exteriorly threaded for receiving a nut to clamp the partition plate and the oil chamber together and against their respective shoulders on the conduit.

4. A carbureter comprising an oil chamber and an air heating chamber, both substantially cylindrical in form and positioned end to end; a tubular member open from end to end and constituting a conduit extending through both said chambers; a partition plate between said chambers stopped upon the top of the oil chamber; and a flange which forms the top of the air heating chamber, and a heating coil encompassing said conduit within the air heating chamber stopped between said partition plate and flange, the exterior wall of said heating chamber being a shell which telescopes outside of the partition plate and which is flanged at the upper end to engage above the flange of the conduit, said shell having apertures for the intake and exit ends of the heating coil.

5. A carbureter comprising an oil chamber and an air heating chamber, both substantially cylindrical in form and positioned end to end; a tubular member open from end to end and constituting a conduit extending through both said chambers; a partition plate between said chambers stopped upon the top of the partition plate; a flange which forms the top of the air heating chamber, a heating coil encompassing said conduit within the air heating chamber stopped between said partition plate and flange, the exterior wall of said heating chamber being a shell which telescopes outside of the partition plate and which is flanged at the upper end to engage above the flange of the conduit, said shell having apertures for the intake and exit ends of the heating coil, a valve seat mounted on said shell at one side an adjusting nut mounted on the shell at the opposite side; a sleeve extending through the conduit in axial alinement with

the valve seat; a valve seating in said valve seat having a stem which is slidably mounted in said sleeve and which protrudes toward the adjusting nut, and a spring stopped on said stem and against the adjusting nut.

In testimony whereof I have hereunto set my hand at Chicago, Illinois, this 25th day of July 1911.

JOHN K. STEWART.

Witnesses:
CHAS. S. BURTON,
LUCY I. STONE.