

No. 709,703.

Patented Sept. 23, 1902.

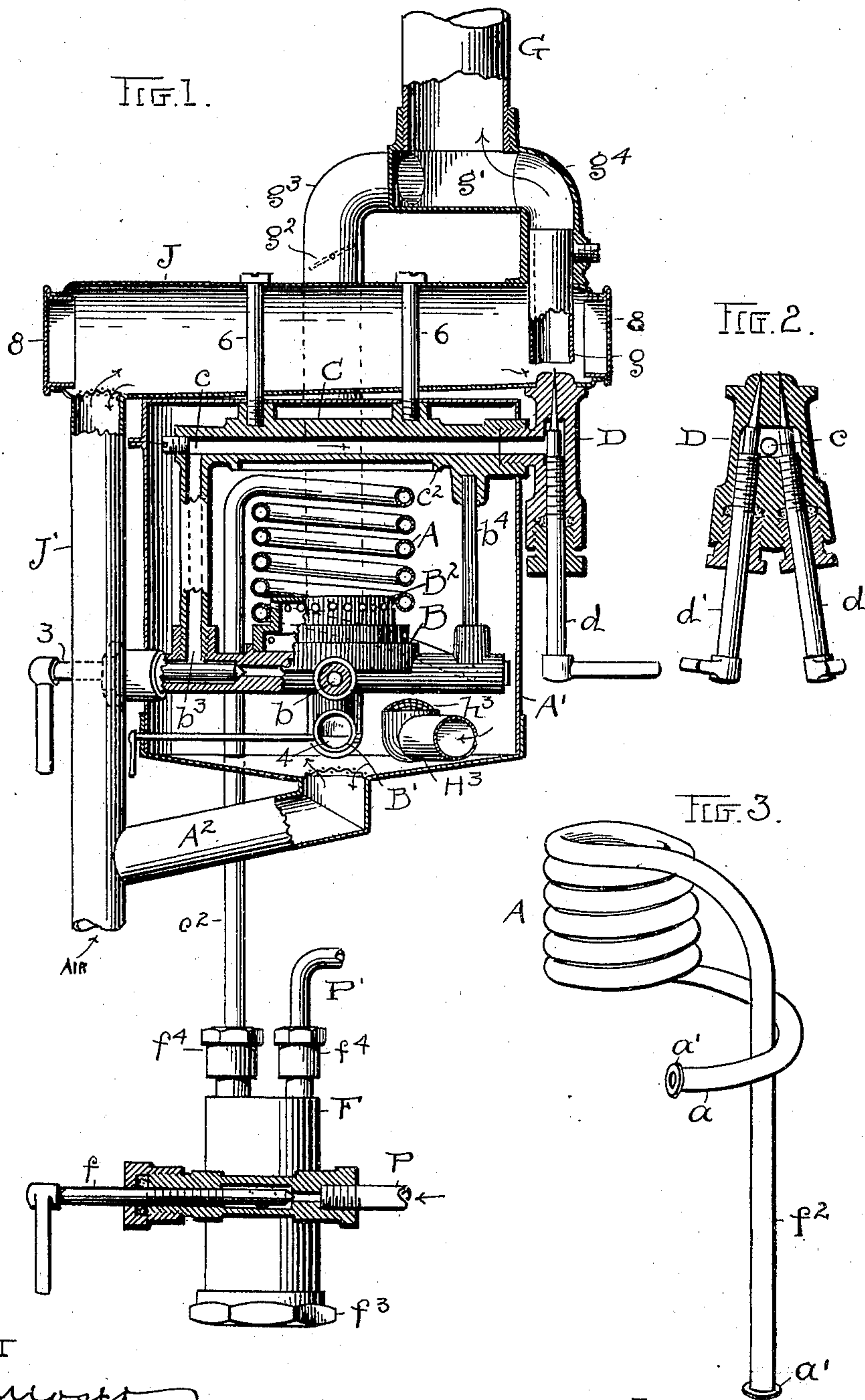
T. J. FORDE.

CARBURETER.

(Application filed Mar. 18, 1902.)

(No Model.)

2 Sheets—Sheet 1.



ATTEST

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ATTY

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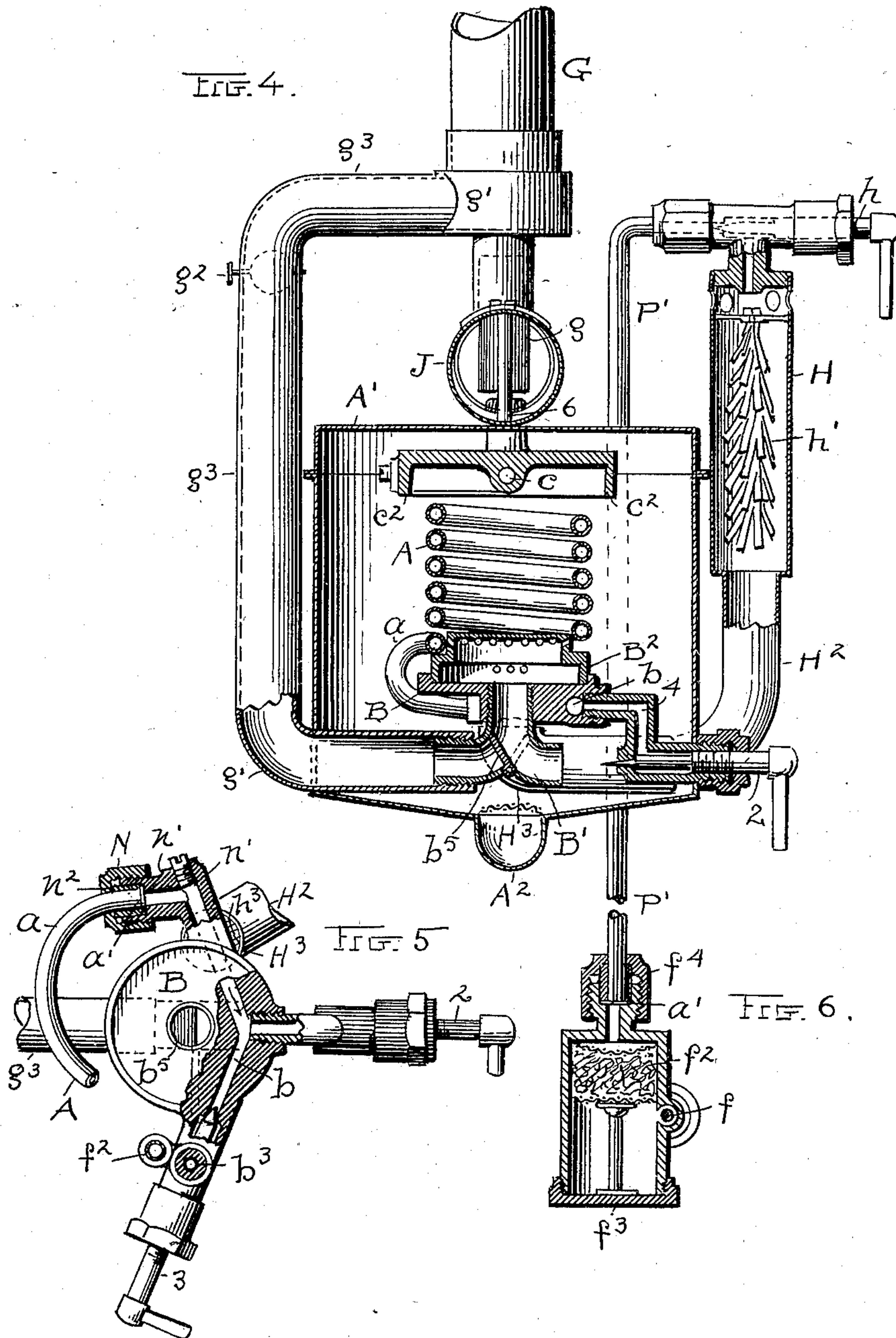
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ATTEST

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# UNITED STATES PATENT OFFICE.

THOMAS J. FORDE, OF GENEVA, OHIO.

## CARBURETER.

SPECIFICATION forming part of Letters Patent No. 709,703, dated September 23, 1902.

Application filed March 18, 1902. Serial No. 98,714. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. FORDE, a citizen of the United States, residing at Geneva, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Carbureting Apparatus; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to carbureting apparatus; and the invention consists in an apparatus constructed substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of the apparatus. Fig. 2 is a sectional elevation of a set of valves for controlling the flow of the vapor or gas from the said apparatus to the main, as hereinafter fully described. Fig. 3 is a perspective elevation of a form of generator-coil used with this apparatus. Fig. 4 is a vertical sectional elevation of the apparatus at right angles to Fig. 1 and substantially through the center thereof. Fig. 5 is a horizontal sectional plan of the base for a generator-coil and certain other members associated therewith. Fig. 6 is a vertical sectional elevation of a form of oil-filter used with this invention.

The apparatus as thus shown and described is intended to be placed in some convenient position in or about the building or buildings where the gas is to be used, and in residences the said apparatus may safely be placed in the cellar; but the oil-tank from which it is supplied should be kept under cover on the outside of the building, where there can be no possible danger of explosion if for any reason explosion might occur. However, if the heavier grades of hydrocarbon be used, such as kerosene, the tank containing the oil may very safely be placed in the cellar, and no danger need be feared from an explosion.

Referring to Figs. 1 and 3, A represents a generating-coil in which the oil is converted into gas or vapor for supplying the same for use, and the said coil is shown as formed out of comparatively thin metal, such as brass or copper tubing, and soft, preferably, so that

the extremities thereof may be flared to produce flanges  $a'$ , by which an effective coupling of the pipe is made without packing or other similar means for preventing leakage. The formation of this coupling is illustrated in Fig. 5. As already indicated, the gas or vapor manufactured in this producer is of a fixed kind which will not condense and which will travel after the manner of ordinary illuminating-gases and especially as far and as satisfactorily as may be desired within the limits of a building, or possibly a few adjacent buildings, to which a single apparatus of this kind is generally limited.

The coil A as shown here is supported upon an annular base B, which has a duct  $b$  across the same, Fig. 5, open to said pipe A and connected therewith by means of a coupling comprising a coupling-nut N and a projection engaged upon a right-angled projection  $n'$  and bearing against a collar or sleeve  $n^2$  on tube A, which itself presses against flange  $a'$  of said tube or pipe. This connects end  $a$  of pipe A with generator-base B, while the other end goes to the source of oil-supply through filter F, as will be seen.

Valves 2 and 3, respectively, control the flow of the gas from the generator-base B, and the jet or opening controlled by valve 2 is practically the secondary burner-jet, which discharges into one branch or arm of a substantially T-shaped member  $B'$ . This branch or portion on the part  $B'$  opposite the jet or valve 2 serves as a mixing-tube, and the stem of said part  $B'$  opens up through the base B and discharges into the interior of the coil-heating or main burner  $B^2$ .

The burner  $B^2$  is substantially of a cup shape, inverted to rest upon the base B, and is of two diameters, with its upper half reduced to attach the coil A and perforated in one or both of its elevations to promote the escape of vapor and to provide a burner-flame upon the outside thereof to heat said coil.

The valve 3 is nearly directly opposite valve 2 and also communicates with duct or passage  $b$  and opens duct  $b^3$  to base B and which issues through body D, where valves  $d$  and  $d'$  control the outflow of gas. In the passage of the gas or vapor from duct  $b^3$  it travels



through the duct *c* in the cap C, which rests over the coil A and has down-flange *c*<sup>2</sup>, adapted to more or less gather the heat arising from burner B and promote the further heating of the coil. The said cap C is connected by bolts 5 6 through the return tube or pipe J, so that the parts B, C, and J are mechanically connected and practically rigid with each other. A small standard *b*<sup>4</sup>, Fig. 1, is socketed in an arm of base B and in the bottom of cap C at 10 one side and serves to make a rigid connection at that side.

The secondary initial burner-valve 2 of course is closed when the apparatus is under 15 way and the valve 3 is open, because then all the vapor or gas travels hence through the producer and has no supply connection with main burner B, excepting the overflow which comes from the gas-passage in the head G. It will be noticed that the gas or vapor proceeding through ducts *b*<sup>3</sup> and *c* and admitted through valves *d* or *d'*, or both, enters the mixing-tube *g*, whence the mixture passes by elbow *g*<sup>4</sup> to head *g'*. The main G, which leads 25 off to the building, is connected with the top of head *g'*; but a return-pipe *g*<sup>3</sup> from the head *g'* drops down beneath burner B<sup>2</sup>, Fig. 4, and connects with the opposite branch of the T-shaped part B'. At this point there is 30 a flip-valve *b*<sup>5</sup>, adapted to be turned to close the discharge from valve 2 or the down discharge through pipe *g*<sup>3</sup>, as here shown. If turned in the opposite direction, the said pipe *g'* would be open except to its controlling-damper *g*<sup>2</sup>. By means of said damper the 35 operator can control the quantity of mixed gas which shall flow from head *g'* down into the burner B<sup>2</sup> to sustain the flame for maintaining generation in coil A. Any suitable construction of damper or valve *g*<sup>2</sup> may be 40 used for this purpose. The main body of gas or vapor produced is carried off through the main or pipe G to the building for use.

The tube J is used for two purposes. In 45 the first place it serves as an air-supply to the mixer *g* through the pipe J', which enters tube G at its bottom and lowest end and which presumably goes to the outside of the building for fresh air, and it may be provided with 50 a suitable chamber or valve to control the inflow of air, if that be found necessary. It is furthermore provided with a downwardly-inclined bottom adapted to discharge into the down-pipe J' through elbow A<sup>2</sup>, so that any 55 condensations of vapor that may occur will be carried off through the oil-supply pipe, thus keeping the parts clear of oil. A suitable drum or casing A' incloses the generator-base B and the coil A, the cap C, and associated parts, so that the heat generated by 60 the main burner is confined within this space or casing and the work of generation is promoted. The tube J is furthermore provided with a removable cap 8 at each end, through 65 which easy admission is effected thereto for cleansing or other purposes.

As a primary or first lighting and heating

medium for the apparatus I employ a medium, as clearly seen in Figs 1 and 4, which comprises a comparatively large vaporizing tube 70 or chamber H, in which there is an especially-constructed vaporizer *h'*, made in this instance of sheet metal cut into a large number of strips, so as to afford a very large surface upon which the oil may drop from one strip to 75 another as it descends and in its exposure be evaporated by the atmosphere, and thus pass down through the tube H<sup>2</sup> to the extremity H<sup>3</sup> thereof, Fig. 1, where it is provided with a burner *h*<sup>3</sup> at its extremity and may be lighted 80 by a match or taper. It will be noticed that the said extremity or initial burner *h*<sup>3</sup> comes directly beneath and outside the base B within casing A' and in position to heat all of said parts to a vaporizing state and especially 85 the generator-base. When this has been done, the valve 2 may be turned on and the source of supply through the vaporizing-chamber H cut off. Then when the parts are brought to the desired state of heat the valve 90 2 may likewise be closed, valves 3 and *d* and *d'* opened, when the burner B<sup>2</sup> will be supplied with mixed vapor and air from the down-pipe *g'*, as already described. Then the apparatus is ready for a continuous run. 95

It is essential in an apparatus of this kind that the oil should be as thoroughly cleansed as possible before it enters into the passages of the apparatus. To this end I bring the oil 100 through a suitable filter F in the oil-supply channel through pipe P and through which the flow of the oil is controlled by a valve *f*. The said filter has a suitable filtering media *f'*, designed to be of a character which will absolutely cleanse the oil of all impurities which 105 are not of a strictly fluid kind, and connected with the filter at its top is the pipe *f*<sup>2</sup>, which is practically a portion of the coil-pipe A, and the pipe P', which conveys the oil to the initial vaporizing-chamber H, and valve *h* at the 110 top of said chamber, Fig. 4, controls the flow of oil thereto. The said filter has a removable bottom *f*<sup>3</sup>, which enables the filtering material to be removed and replaced.

It will be noticed that the mixer-tube *g* is 115 adjustably supported, so as to provide for the admission of more or less air through the tube to chamber J.

What I claim is—

1. In a gas-carbureting apparatus, a generating-coil, a generating-base on which said 120 coil is supported having a valve-controlled gas-duct open to said coil, a main to which the gas flows from the coil and a mixer at the opening for the gas into the said main, substantially as described. 125

2. A generating-coil for hydrocarbon gas and a generating-base supporting said coil having a plurality of gas-outlets, a burner on said base at the bottom of said coil and a 130 valve for each of said outlets, substantially as described.

3. The generator-coil and the base on which it is removably secured, a cap over said coil



and a conduit connecting said base and cap, and a main to which the gas flows from said base, substantially as described.

5 4. The generator-base and a generator-coil detachably supported thereon and open thereto, a cap over the coil and a gas-duct therein and a conduit-support for the cap resting on said base and open to the duct therein and to the said cap, substantially as described.

10 5. The generator-base and the generator-coil open thereto, a cap over the coil supported on said base, and a gas-conduit from the said base through said cap, in combination with a main to which the gas is delivered, 15 and a valve-controlled connection from the duct in said cap to said main to deliver the gas, substantially as described.

20 6. The generator-base and the generator-coil open thereto, the casing about the said parts having a depressed bottom, and a drain-pipe from said bottom, substantially as described.

25 7. The generator-coil and the base therefor provided with a vapor-duct open to said coil, a vaporizing device for the oil and a tube leading therefrom and having a burner at its ex-

tremity beneath said base, whereby the said base is initially heated, substantially as described.

8. The combination of the generator-base, 30 and generator-coil thereon and open thereto and a burner on said base within the lower portion of the coil, a cap over the coil and a duct from said base through said cap, an air-supply tube over said cap, a mixer therein 35 and a valve controlling said duct and opening into said mixer, substantially as described.

9. The generator-base and the coil in open connection therewith and the burner on said 40 base, in combination with a valve-controlled duct from base, and a return-pipe arranged to discharge a portion of the outgoing gas through said duct to the burner on said base, substantially as described. 5

Witness my hand to the foregoing specification this 11th day of March, 1902.

THOMAS J. FORDE.

Witnesses:

R. B. MOSER,  
T. M. MADDEN.