

No. 738,604.

PATENTED SEPT. 8, 1903.

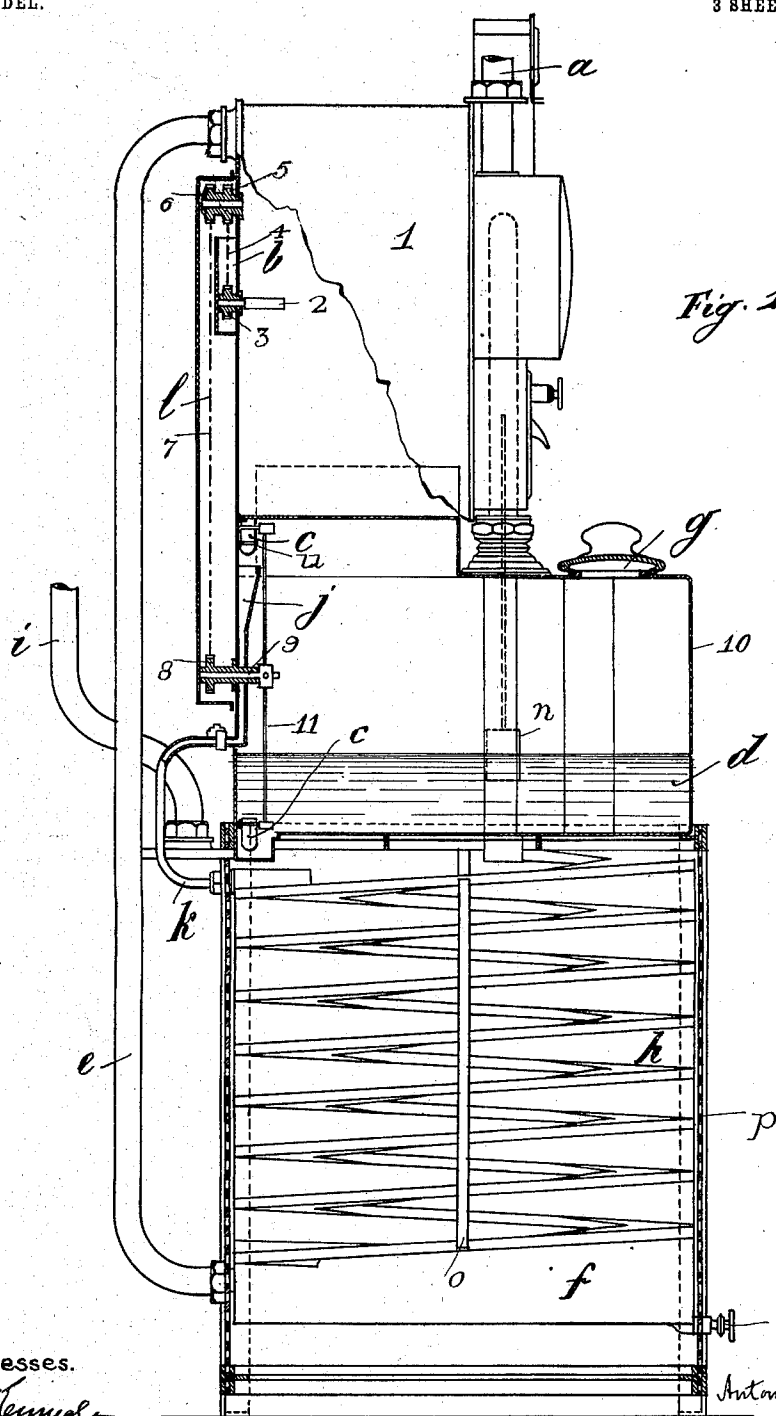
A. CARISSIMO, G. CROTTI & E. ANTONIOLI.

CARBURETING APPARATUS.

APPLICATION FILED JAN. 25, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.

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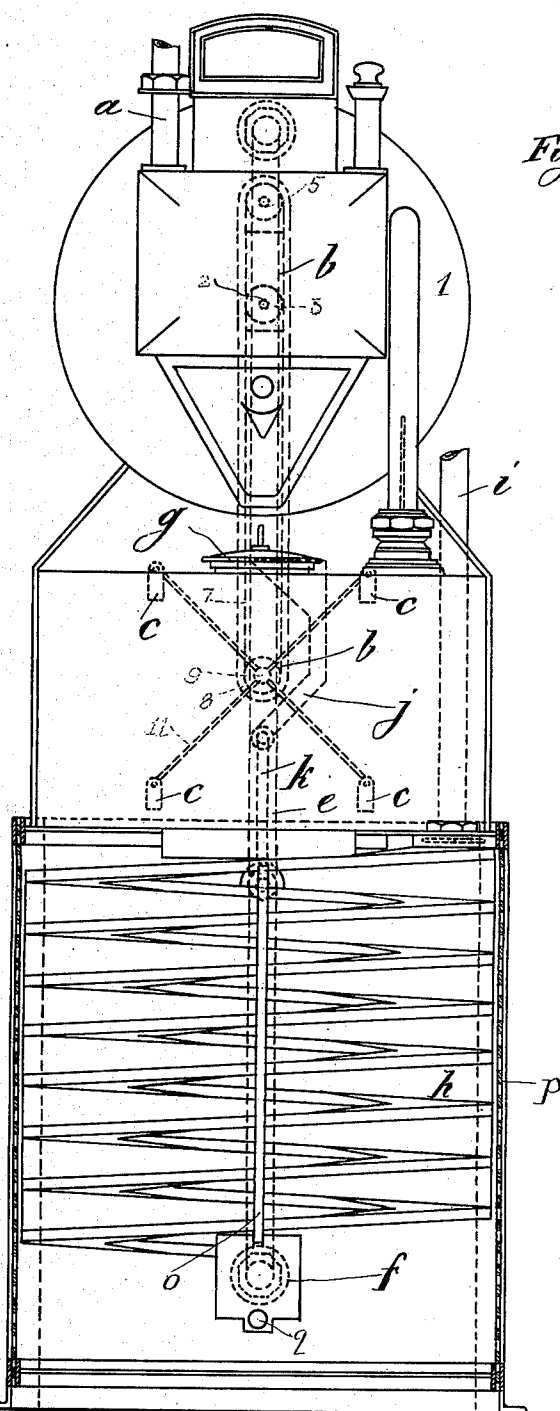


Fig. 2.

Witnesses

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3 SHEETS—SHEET 3.

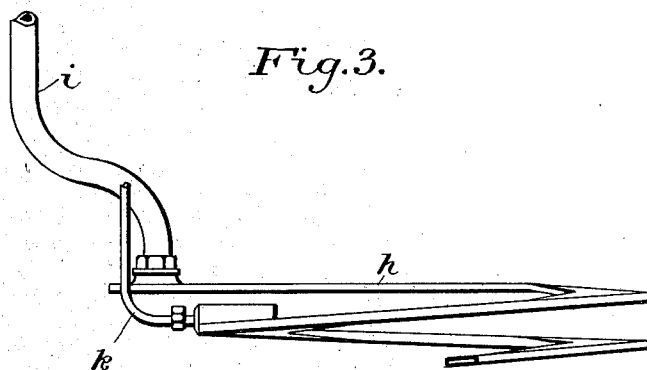
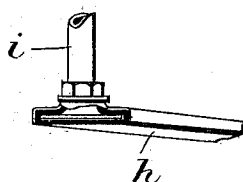


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

ANTONIO CARISSIMO, GIOVANNI CROTTI, AND EMILIO ANTONIOLI, OF
MILAN, ITALY.

CARBURETING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 738,604, dated September 8, 1903.

Application filed January 25, 1902. Serial No. 91,168. (No model.)

To all whom it may concern:

Be it known that we, ANTONIO CARISSIMO, GIOVANNI CROTTI, and EMILIO ANTONIOLI, engineers, subjects of the King of Italy, all residing in Milan, in the Kingdom of Italy, (whose full postal address is 3 Via Gesù, Milan, aforesaid,) have invented certain new and useful Improvements in Carbureting Apparatus, for which application has been made in Italy, dated June 26, 1901; in France, dated December 23, 1901, and in Spain, dated December 25, 1901.

This invention has for its object a carbureter adapted to produce a mixture of air and vapor of liquid hydrocarbons of any suitable composition, said composition always remaining the same per unit of volume whatever may be the quantity of mixture produced and whatever may be the external temperature.

By this invention in order to insure that the composition or percentage of the mixture shall be constant we start from the principle of giving the apparatus a somewhat extended surface of contact with the surrounding external air in order that the heat necessary for the vaporization shall not be furnished by the benzine which is to be vaporized or by the air employed in the vaporization of the benzine, but by the unlimited reservoir of heat contained in the atmosphere. In the apparatus which forms the object of the present invention the mixture is thus obtained by means of a current of air forced into a pipe of suitable form which is exposed to the atmosphere, into which pipe hydrocarbon liquid is introduced successively in proportionate quantities with the volumes of air with which it is to be mixed.

Referring to what has just been stated, the pipe above mentioned must have a given surface exposed to the surrounding air, the extent of which surface must depend on the composition of the gas desired and which surface must be sufficient for transmitting from the surrounding air to the interior of the said pipe as many calories or units of heat as are necessary in order to evaporate all the hydrocarbon introduced into the pipe, whatever may be the temperature of the surrounding air. By this means the result is obtained of a constant difference of temperature existing

between the external air and the gas produced for a given predetermined quantity of the latter, whatever may be the external temperature, and thus the minimum temperature of the gaseous mixture may be limited at will to a temperature corresponding with a given production and a minimum given temperature of the surrounding air.

The arrangement possesses the following characteristic peculiarities: first, the circulation in opposite directions of currents of air and hydrocarbon; second, the operation, by means of a chain, of the apparatus for supplying the carbureting liquid, the said chain-gear having the advantage of avoiding the use of a stuffing-box for the water of the meter, which stuffing-box is necessary in other arrangements, and that the device for drawing the carbureting liquid is actuated directly by the spindle of the meter.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of my device from front to rear, parts being shown in elevation. Fig. 2 is a front elevation of the same, partly in section. Fig. 3 is an elevation, on an enlarged scale, of a portion of the carbureting-coil and its connections, showing how the carbureting liquid is supplied thereto and how the carbureted air finds its escape. Fig. 4 is a sectional perspective view of the end of the coil where it joins the pipe for the discharge of the carbureted air.

Referring to the drawings, the meter represented in the drawings is a wet gas-meter; but it may be of any other suitable type. The air forced in by an air-compressor of any suitable type enters the apparatus at *a* and encounters a drum, (not shown,) but which may be of the usual and ordinary construction in meters of this character and which is mounted within a casing 1 on a stem 2, connected with a sprocket-wheel 3, mounted in bearings in the casing and connected by a chain 4 with an idler sprocket-wheel 5 on a second idler sprocket-wheel 6, which latter is in turn connected by a sprocket-chain 7 with a sprocket-wheel 8 on a horizontal shaft 9, mounted in bearings in the side of a tank 10, into which tank the carbureting-liquid *d* is introduced through opening *g* and which tank is provided with an indicating-float *n*. The

shaft 9 carries on its inner end radial arms 11, each provided with a pivoted cup or pocket *c*, by which when the shaft is rotated through the action of the incoming air on the drum in the meter the carbureting liquid will be lifted from the supply in the tank and discharged into the carbureter, as will be more fully described hereinafter, the pivoted cups encountering in succession a stop-pin *u*, by which they are tilted, so as to discharge their contents. The amount of liquid which is lifted is thus exactly proportional to the volume of air introduced, and consequently the supply of carbureted air is also strictly proportional. The air passing through *a* descends to the bottom of the apparatus into a casing *f*, inclosed in a perforate shell *p*, and from thence rises through a flat coil *h* up to the discharge-pipe *i*, which communicates with the interior of said coil, as shown in Fig. 4, on its way encountering the hydrocarbon, which descends in a reverse direction from a small hopper *j*, provided with a small pipe *k*, into which hopper the liquid is poured by the cups or scoops *c*. Not only is the surface of contact between the liquid benzine which wets the coil and the air which is introduced therein relatively very extensive by reason of the great length of the coil *h*, but also the external surface exposed to the surrounding air, and consequently to which external heat may be imparted, is sufficiently great to allow of the evaporation of the hydrocarbon whatever may be the external temperature.

The coil *h* is sustained within the shell *p* by a vertical plate *o*, extending above the casing *f*, which latter is provided at its bottom with a cock *q* for the discharge of the heavy hydrocarbons collecting on the bottom of said casing.

The apparatus may be so calculated that

with the maximum production of gas the temperature in the interior of the coil can never fall beyond a certain limit below the temperature of the surrounding air.

It will be observed that by reason of the form of the coil, which is flat in cross-section, the liquid entering and flowing downward through the same is spread out and occupies an extended area and presents an extended surface to the influence of the air flowing through the coil in the opposite direction, so the evaporation of the liquid readily takes place, and by reason of the length of the coil there is presented at all times to the action of the air an extended surface of the liquid. Further, by reason of this flat form of the coil there is presented to the external atmosphere a great extent of surface, and this absorbing the heat from the atmosphere in great quantities utilizes the same in vaporizing the liquid, so that it is not necessary to deprive the latter or the incoming air of its heat and thereby cause changes in their temperatures.

We declare that what we claim is—

In a carbureting apparatus the combination with a carbureting-coil of flat form in cross-section exposed to the atmosphere, of means for passing a current of air through said coil, and means controlled by the flow of the air for circulating a current of carbureting fluid through said coil in a direction opposite to that of the air.

In witness whereof we have hereunto signed our names, this 27th day of December, 1901, in the presence of two subscribing witnesses.

ANTONIO CARISSIMO.
GIOVANNI CROTTI.
EMILIO ANTONIOLI.

Witnesses:

HENRY I. SMITH,
MICHELEDE DRAGO.