R. C. DAWSON.

METHOD OF CARBURETING AIR.

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1,019,430.

Patented Mar. 5, 1912.

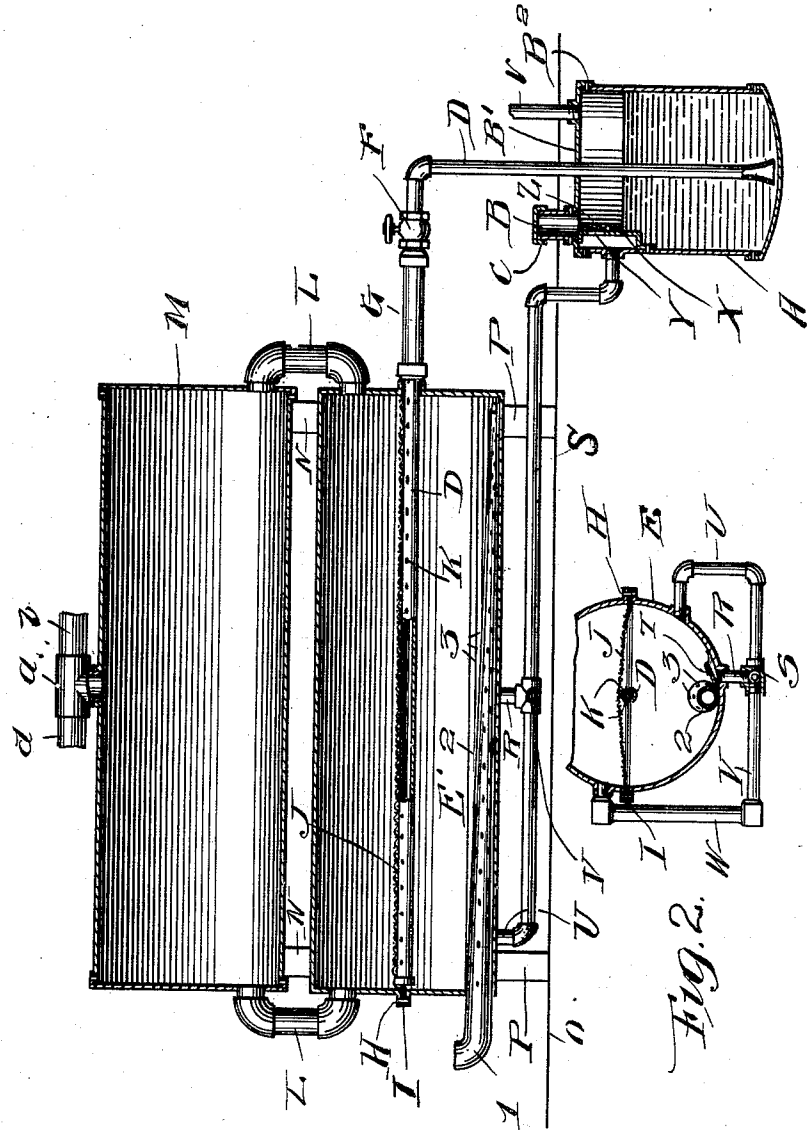

Fig. 1.

Fig. 2.

WITNESSES

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METHOD OF CARBURETING AIR.

1,019,430. Specification of Letters Patent. Patented Mar. 5, 1912.

Original application filed May 14, 1910, Serial No. 561,297. Divided and this application filed December 7, 1910. Serial No. 596,137.

To all whom it may concern:

Be it known that I, ROBERT C. DAWSON, a citizen of the United States of America, residing at McKeesport, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Methods of Carbureting Air, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a method of carbureting air, is a division of application Serial No. 561,297, filed by me May 14, 1910, in which the apparatus is claimed, and has for its object to provide a method for such purpose which will thoroughly enrich the air with hydrocarbon so that the ultimate product will be thoroughly satisfactory when used for illuminating purposes and which will be thoroughly efficient for use in connection with explosive engines.

A further object of this invention is to provide a method of carbureting air having as a step thereof the exhausting of the residual hydrocarbon from the carbureting chamber when the operation of carbureting is discontinued, whereby the possibility of an explosion, generally due to the carbureting chamber containing hydrocarbon, when an apparatus is not working, is reduced to a minimum.

As showing one form of an apparatus capable of carrying out the method, reference is had to the accompanying drawings in which:—

Figure 1 is a vertical section of the apparatus, and Fig. 2 is a transverse section of the carbureting chamber, the latter broken away at its top.

The method in accordance with this invention comprises the supplying of the hydrocarbon by fluid pressure in the form of jets to a carbureting chamber, and simultaneously with the supplying of the hydrocarbon breaking up the jets whereby a part of the hydrocarbon will be volatilized and ascend to the upper portion of the carbureting chamber, then passing jets of air of uniform pressure, first through the liquid and then through the volatilized hydrocarbon, whereby when the air first passes through the liquid hydrocarbon, it will be enriched by taking up the latter and then admixing it with the volatilized hydrocarbon whereby it will be further enriched, and then exhausting the residual hydrocarbon contained in the mixing chamber when the hydrocarbon supply thereto is discontinued.

Referring to the drawings which illustrate one form of apparatus capable of carrying out the method, A denotes a reservoir which is located in the ground or exteriorly of the building where the apparatus or machine is used, the reservoir, by way of example, is shown as formed of a metallic tank which may be formed of any suitable material and is provided with a vertically disposed inlet nipple B normally closed by a detachable cap C and it is through the nipple B that the reservoir is supplied with hydrocarbon. The nipple B is connected to a cover B′ which is secured in position by the hold-fast device B^2. Extending through the cover B′ and into the reservoir A and to a point in proximity to the bottom of the reservoir is a hydrocarbon supply pipe D which is flared at its lower end to allow the hydrocarbon to easily enter the same. The pipe D extends into and substantially from end to end of a carbureting tank E which constitutes a carbureting chamber E′. That portion of the pipe D which is arranged within the carbureting chamber E′ is perforated so that the hydrocarbon will be supplied to the carbureting chamber E′ in the form of jets. The pipe D exteriorly of the carbureting tank E is provided with a globe valve F and a glass section G. The valve F is employed for shutting off the supply of hydrocarbon to the carbureting chamber E′ and the glass section G is used so that one can observe when the hydrocarbon is flowing through the pipe D toward the carbureting chamber E′. Opening into the reservoir A through the top of the latter is a compressed air supply pipe —*v*— which communicates with a suitable source of air supply. The carbureting tank D is formed of two semicylindrical sections as best shown in Fig. 4 and with the confronting edges thereof flanged and connected together by hold-fast devices as at H. Between the confronting edges of the sections of the carbureting tank E are positioned lead or soft metal gaskets I and extending between said gaskets is a screen or wire sieve J which is arranged over the perforated portion K of the pipe D within the carbureting tank E. The screen J constitutes a means for separating the light from the

heavy hydrocarbon as the hydrocarbon is supplied to the carbureting chamber E′ in the form of jets through the pipe D or in other words the screen J breaks up the hydrocarbon, so that a part of the hydrocarbon will be volatilized and ascend to the upper portion of the carbureting chamber, and the remaining part of the hydrocarbon, *i. e.*, the liquid hydrocarbon, will fall to the bottom of the carbureting chamber E′. The volatilized hydrocarbon will pass through the screen J to the upper part of the carbureting chamber E.

Arranged over the carbureting tank E is a tank M for the reception of the carbureted air and is connected at its ends by the pipes L to the upper portion of the carbureting tank E whereby the carbureted air is discharged from the carbureting chamber E′ into the tank M. The tank is supported above the carbureting tank E by brackets N and the carbureting tank E is supported above the floor or ground O by the legs P. The residual hydrocarbon within the carbureting chamber E′, that is to say, the liquid hydrocarbon which remains in the carbureting chamber E′ when the supply is discontinued is exhausted from the chamber E′ by the pipe R which opens into a drain pipe S, the latter extending to the reservoir A. The pipe R opens into the carbureting chamber E′ and arranged in operative relation with respect to the inner end of the pipe R is a spring controlled flap valve T which when the pressure is relieved within the carbureting chamber E′, due to the discontinuing of the hydrocarbon and air supply, automatically opens and allows the remaining hydrocarbon within the carbureting chamber E′ to exhaust therefrom and be returned to the reservoir A. The drain pipe S is provided with two branch pipes U and V, the pipe U constituting an overflow pipe and which communicates with the carbureting chamber E′ and prevents the hydrocarbon from rising too high within the carbureting chamber while the pipe V is used in communication with a sight glass W which allows the elevation of the hydrocarbon within the carbureting chamber being easily observed. That terminus of the drain pipe S which is connected with the reservoir A is inclosed by a casing X provided with an opening Y closed by a flap valve Z. The valve Z is spring pressed and is normally retained in a closed position, particularly during the operation of the machine.

Communicating with the tank M at the top thereof is a T-coupling —*a*— connected by a branch pipe —*d*—. Communicating with the T-coupling —*a*— is an outlet pipe —*b*— which leads to the lamps, burners, or to a suitable reservoir for storing the carbureted air. Mounted upon the T-coupling —*a*— is a burner gage —*c*— or if desired a meter can be connected to the T-coupling to determine the amount of air carbureted. Projecting from the T-coupling —*a*— is a branch pipe —*f*— which communicates with a down pipe —*g*— opening into an air mixer —*h*— which is connected by a pipe —*i*— to the cylinder —*k*— of a gasolene engine —*l*—. The engine —*l*— is of the ordinary type and is provided with an exhaust pipe —*m*—, a battery box —*n*—, and an ignition or explosive chamber —*o*—. Upon the pipe —*d*— is installed a globe valve —*p*— for controlling the supply of gas from the tank M to the gasolene engine.

Arranged in operative relation with respect to the engine —*l*— is an air pump —*r*— which is driven through the medium of the belt —*s*— operatively driven from the engine —*l*—. The air pump —*r*— is provided with an intake pipe —*t*— and also communicates with the air reservoir —*u*—, the latter being connected by a pipe —*v*— to the reservoir A to force the hydrocarbon upwardly into the pipe D and into the carbureting chamber E′ formed by the tank E. The pipe —*v*— is provided with a spring controlled check valve —*w*— and a globe valve —*x*—. The valve —*w*— controls the pressure of air to the reservoir A and the globe valve allows the supply of air to be shut off during the operation of the machine, when it is desired to fill the reservoir A.

The reference character 1 denotes a compressed air supply pipe connected to a tapering nozzle 2 which extends into the bottom of the carbureting tank E and is perforated and is further positioned in proximity to the valve T. The perforations in the nozzle 2 are indicated by the reference character 3 and are so disposed that the liquid hydrocarbon which accumulates in the bottom of the carbureting chamber E′ will be agitated and subjected to the action of the air which is supplied to the carbureting chamber E′ in the form of jets. The air passing through the liquid hydrocarbon in the lower portion of the carbureting chamber E′ will be carbureted and it will also be further enriched by the hydrocarbon which is sprayed against the screen J and the volatilized hydrocarbon within the upper portion of the carbureting chamber E′. The nozzle is tapered so that the jets of air will be of uniform pressure as the air is supplied to the carbureting chamber E′.

What I claim is:—

A method of carbureting air comprising the supplying of liquid hydrocarbon in the form of upwardly directed jet within a carbureting chamber, simultaneously with the supplying of the said upwardly directed jets of hydrocarbon breaking the jets of hydrocarbon up to atomize a portion of the hy-

drocarbon, collecting the remaining portion of the supplied hydrocarbon at the bottom of the carbureting chamber, passing upwardly directed jets of air simultaneously and of uniform pressure through the collected hydrocarbon at the bottom of the carbureting chamber, and through the hydrocarbon that is falling toward the bottom of the carbureting chamber thereby enriching the upwardly directed jets of air, and then mixing the enriched air with the atomized hydrocarbon by passing the enriched air up through the said atomized hydrocarbon.

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

ROBERT C. DAWSON.

Witnesses:
S. A. McFARLAND,
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