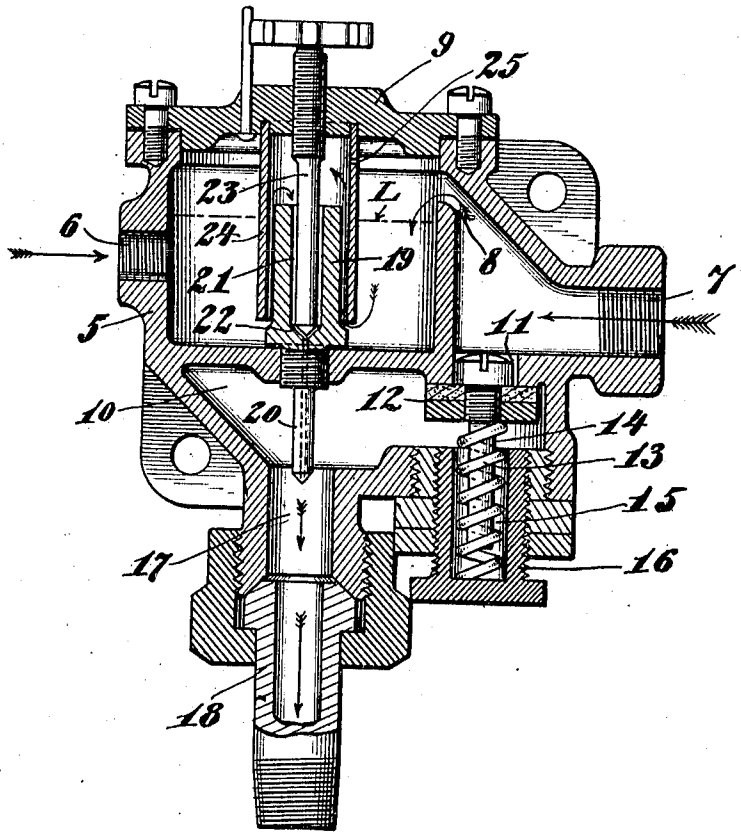
F. H. WALKER.

CARBURETER.

APPLICATION FILED JULY 27, 1911.

1,039,229.

Patented Sept. 24, 1912.



WITNESSES

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CARBURETER.

1,039,229. Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed July 27, 1911. Serial No. 640,775.

To all whom it may concern:

Be it known that I, FRANK H. WALKER, a citizen of the United States, residing at Laporte, in the county of Laporte and State of Indiana, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

The carbureter which is the subject of the present invention is designed more particularly for use in connection with internal-combustion engines for the purpose of supplying an initial charge of fuel to the engine to start the same, the device being independent of the carbureter which supplies the charge when the engine is running.

It is the object of the invention to provide a carbureter of the kind stated which delivers the initial charge by means of compressed air, and, furthermore, to provide a novel combination and arrangement of parts by which an intimate mixture of air and hydrocarbon is effected.

In order that the invention may be better understood, reference is had to the accompanying drawing, in which a vertical section of the carbureter is shown.

Referring specifically to the drawing, 5 denotes a closed vessel having a tapped opening 6 on one side for connection with a source of hydrocarbon or other liquid fuel. Any suitable means may be provided for maintaining a constant fuel level in the vessel, and as such means are old and well known in the art, and form no part of the present invention, they have not been illustrated. On the other side of the vessel is an air inlet passage 7 which opens into the vessel near the top thereof as indicated at 8 above the liquid level therein. The top of the vessel is closed by a cap 9 which is removably secured by screws or other suitable means.

In the bottom portion of the vessel 5 is formed a chamber 10 which is in communication with the air passage 7 through a port 11, which latter is controlled by a spring seated valve 12. The valve opens into the chamber 10, and is normally held closed by a spring 13 coiled around a stem 14 depending from the back of the valve and extending into a longitudinal recess or bore 15 in a plug 16 screwed into the wall of the chamber 10, the spring being located between the valve and the inner end of the recess. The tension of the spring may be regulated by the plug 16. The chamber 10 has an outlet 17 to which is connected a suitable coupling member 18 for connection to the intake of the engine.

Into the bottom of the vessel 5 is screwed a nozzle having its inlet end 19 extending into the vessel, and its tip or outlet end 20 extending through the chamber 10 in line with the outlet 17 so as to discharge into the latter, the tip projecting slightly into the outlet. The bore 21 of the inlet end of the nozzle has a valve seat 22 which is controlled by a needle valve 23 threaded through the cap 9. To the cap 9, on the inside of the vessel 5, is also secured a depending cylindrical sleeve 24 which surrounds the inlet end 19 of the nozzle in spaced relation therewith and in close proximity thereto to form a contracted passage to the nozzle inlet. The lower end of the sleeve is spaced from the bottom of the vessel, and near the top of the sleeve, above the inlet end of the nozzle and the liquid level in the vessel, the sleeve has a small air port 25 which is for a purpose to be presently described.

The operation of the carbureter is as follows: The air inlet 7 will be connected to a suitable source of compressed air. The dotted line L shows the fuel level in the vessel. Upon turning the air on, the pressure thereof on the top of the liquid fuel forces a charge of the same up into the sleeve 24 and thence into the bore of the nozzle from which it is discharged by the tip 20 into the outlet 17. When the air pressure in the inlet 7 overcomes the tension of the spring 13, the valve 12 opens, and air flows from the inlet through the port 11 into the chamber 10 and past the mouth of the nozzle into the outlet 17. Air also enters the sleeve through the port 25, and the pressure within the sleeve becomes equal to that without the same, and the liquid within the sleeve falls to the normal level. At the same time, the air entering the port 25 mixes with the liquid passing through the nozzle and helps to spray it at the tip of the latter. The sleeve therefore serves as a carbureting chamber. The outlet 17 is a mixing chamber, the spray upon issuing from the tip of the nozzle mixing with the air flowing past the same.

It will be evident from the foregoing that the carbureter depends upon a pressure to vaporize the liquid by breaking it into a fine spray A small delivery pipe carries the

vapor quickly to the engine cylinder, thereby avoiding as much as possible the vapor coming in contact with the surface of the pipe, as this has a tendency to thin the mixture, especially in cold weather. The mixing of the liquid and air depends on the drawing action of the air as it passes the mouth of the nozzle under a heavy pressure, and it picks up the liquid which is sprayed strongly from the nozzle because of the greater pressure forcing it down, the difference in the pressures existing in the carbureting and mixing chambers depending mainly on the tension of the valve spring 13. The air passing down the nozzle with the liquid gets well mixed, under pressure, and when the mixture issues from the mouth of the nozzle, the air expands under the lighter pressure existing there and throws the liquid with more force into the passing air current.

The carbureter is simple in construction and it effectually serves the purpose for which it is designed. The preferred embodiment of the invention has been shown, but it will, of course, be understood that the structure is capable of considerable modification within the scope of the invention as herein set forth and claimed.

I claim:

1. In a carbureter, a liquid fuel vessel having an air inlet and a mixture outlet, a jet nozzle having its inlet connected to the vessel and its outlet discharging into the mixture outlet, means for discharging fuel from the vessel through the nozzle by air pressure, means for delivering air under pressure past the outlet of the nozzle, and a pressure reducing valve for said delivery means.

2. In a carbureter, a liquid fuel vessel having a compressed air inlet and a mixture outlet, a nozzle extending into the vessel and discharging into the mixture outlet, a sleeve surrounding the inlet end of the nozzle and having an air port above the liquid level in the vessel, means for delivering air under pressure into the mixture outlet past the mouth of the nozzle, and a pressure reducing valve for said delivery means.

3. In a carbureter, a liquid fuel vessel having a compressed air inlet and a mixture outlet, a nozzle extending into the vessel and discharging into the mixture outlet, a sleeve surrounding the inlet end of the nozzle and located in close proximity thereto to form a contracted passage to the nozzle inlet, said sleeve having an air port above the liquid level in the vessel, and means for delivering air under pressure into the mixture outlet past the mouth of the nozzle.

4. In a carbureter, a liquid fuel vessel having a compressed air inlet and a mixture outlet, a nozzle extending into the vessel and discharging into the mixture outlet, a sleeve surrounding the inlet end of the nozzle and having an air port above the liquid level in the vessel, an air passage from the aforesaid air outlet past the mouth of the nozzle, and a pressure-reducing valve in said passage.

5. In a carbureter, a liquid fuel vessel having a compressed air inlet and a mixture outlet, a nozzle extending upwardly into the vessel from the bottom thereof and discharging into the mixture outlet, a sleeve depending from the top of the vessel and surrounding in spaced relation that portion of the nozzle which extends into the vessel, the lower end of the sleeve being spaced from the bottom of the vessel, and its upper end above the liquid level in the vessel, and having an air port, means for delivering air under pressure into the mixture outlet past the mouth of the nozzle, and a pressure reducing valve for said delivery means.

6. In a carbureter, a liquid fuel vessel having a compressed air inlet and a mixture outlet, a nozzle extending into the vessel and discharging into the mixture outlet, a sleeve surrounding the inlet end of the nozzle and located in close proximity thereto to form a contracted passage to the nozzle inlet, said sleeve having an air port above the liquid level in the vessel, means for delivering air under pressure into the mixture outlet past the mouth of the nozzle, and a pressure reducing valve for said delivery means.

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

FRANK H. WALKER.

Witnesses:
EZRA C. SHURRATT,
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