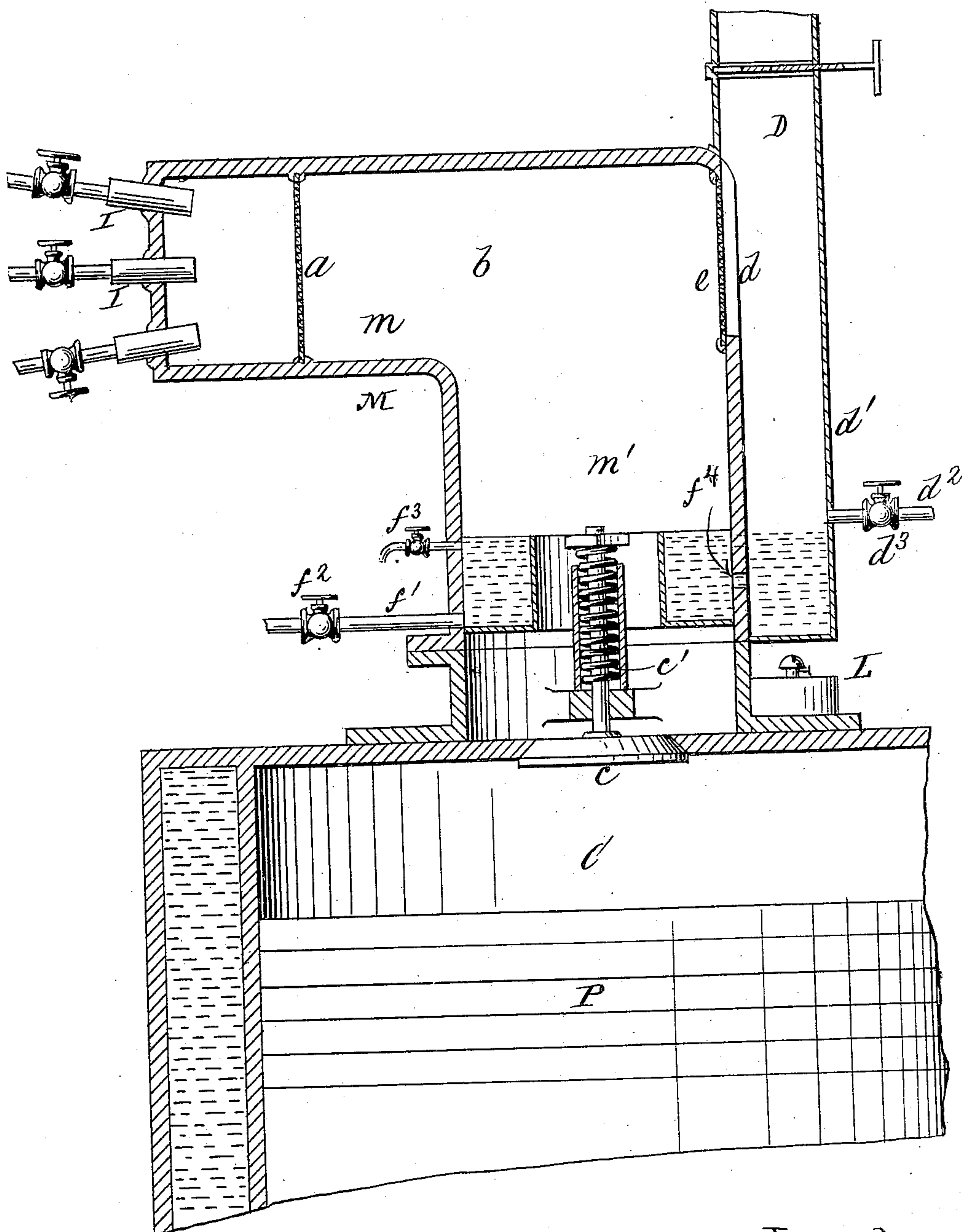


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A. A. LOW.
HYDROCARBON MOTOR.
APPLICATION FILED JUNE 2, 1906.



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ABBOT AUGUSTUS LOW, OF HORSESHOE, NEW YORK.

HYDROCARBON-MOTOR.

No. 868,281.

Specification of Letters Patent.

Patented Oct. 15, 1907.

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To all whom it may concern:

Be it known that I, ABBOT AUGUSTUS LOW, a citizen of the United States, residing at Horseshoe, St. Lawrence county, and State of New York, have invented certain new and useful Improvements in Hydrocarbon-Motors, of which the following is a specification.

My invention relates to the class of motors in which kerosene is used, either alone, or in conjunction with other forms of hydro-carbon, and is an improvement upon the structure set forth in my concurrent application Serial No. 319,010 filed May 28, 1906 in which provision is made for collecting the excess or liquid drip of the hydro carbon injected into the mixing chamber.

The essential and distinguishing feature of my present invention consists in providing means whereby the excess or liquid drip thus collected may be vaporized by heat and returned to the mixing chamber with the air supply, thereby disposing of, and utilizing such excess or drip in the most advantageous manner, since the vapor thereof, being introduced directly into the supply of incoming air before the latter enters the mixing chamber, is in a highly nascent condition, and ready for instant combustion when mixed with the rest of the charge.

I am also enabled by my present invention to utilize the excess of drip of hydro-carbon thus collected as a means for effecting the preliminary starting of the engine, or even to introduce a supplemental supply of liquid hydro-carbon to be vaporized and used for the purpose as hereinafter fully set forth.

The invention consists primarily, in the use, in conjunction with a receptacle for collecting and holding temporarily such liquid drip or excess of hydro-carbon of suitable means, as a lamp or equivalent device, for heating said receptacle so as to vaporize the liquid hydro-carbon as before stated; and secondarily the invention consists in arranging said drip collecting receptacle in direct communication with the air supply conduit so that the vaporized hydro-carbon is returned to the mixing chamber by the incoming air supply; and in providing means for introducing a supplemental supply of liquid hydro-carbon into said receptacle when desired for the purpose of charging the air supply with hydro-carbon vapor independent of the collection of excess or drip from the mixing chamber.

My invention also includes certain other details and combinations hereinafter described and claimed specifically.

In the accompanying drawing, the figure represents a central vertical sectional elevation of the mixing chamber and upper portion of a cylinder of a motor in connection with my means for vaporizing liquid hydro-carbon.

P represents symbolically a piston within the cylinder C, the upper portion of which constitutes the combustion chamber into which the successive charges of

hydro-carbon vapor and air are drawn through the inlet valve *c*, in the usual way, the valve being retained normally on its seat by the spring *c'*.

M is the mixing chamber consisting of the substantially horizontal section *m*, and a vertical extension *m'*, in the lower portion of which latter the inlet valve is seated. The hydro-carbon is introduced into the mixing chamber through one or more injectors I, of any desired construction. Three are shown by way of illustration in the accompanying drawings, one, as the central one, for kerosene, and the others for, say alcohol and naphtha respectively. Kerosene may of course be used, alone, and as my invention relates particularly to its use, I shall hereinafter confine my description thereto.

The injected kerosene first encounters the primary screen *a*, heretofore used for breaking up and diffusing the jet. The impetus with which the kerosene is injected carries it through this primary screen *a*, into the central space *b*, beyond where it is mixed with air admitted through the conduit D,—the portion of a charge of kerosene, if any, not vaporized but remaining in globular form being carried by its inertia against the screen *e*, covering the opening *d*, into the air conduit D.

Atmospheric or compressed air may be used as may be found most expedient. The impinging of the globules of unreduced kerosene against the screen *e*, tends to break them up and disintegrate the oil so that it is in the best possible condition to be taken up and absorbed by the incoming current of air.

If there is an excess of liquid kerosene, some of it will percolate or be precipitated through the screen *e*, and enter the conduit D settling into the cup or pocket *d'*, and another portion of such unvaporized excess will trickle down the screen *e*, and into the annular trough or receptacle *f*, from which it may be drawn off, through a drain pipe *f'*, and valve *f''*. The annular oil reservoir *f*, may also be provided with a pet or tell cock *f'''*, for ascertaining the oil level therein. Thus far I have described a structure which is essentially the same as that disclosed in my concurrent application Serial No. 319,010 filed May 28th 1906, hereinbefore referred to.

The distinguishing feature of my present invention consists in the provision of means for heating and vaporizing any liquid hydrocarbon present in the lower portion of the receptacle *d'*. Any convenient or well known means may be employed for this purpose the lamp L, indicated symbolically in the drawings representing any external means of applying heat to the lower portion of the said receptacle *d'*. Provision may be made for permitting the drip collected in the inner annular receptacle *f*, to flow into the lower portion of the external receptacle *d'*, as by the channel *f''*, the fluid hydro-carbon thus drained from the annular receptacle *f*, taking the place of that vaporized by the

heat applied to the lower portion of said external receptacle d' . The hydro-carbon thus vaporized within the receptacle d' , rises and mingles with the air entering through the conduit D, and is carried by the air into the mixing chamber, to combine with the fresh hydrocarbon injected into the latter. It will be seen that I thus not only collect and eliminate all drip or excess of hydro carbon and prevent its introduction in that form into the combustion chamber, but I also at the same time enrichen and render more combustible the successive charges of hydro-carbon.

In order not to be dependent on the drip or excess of hydro-carbon above set forth I provide independent means for introducing liquid hydro-carbon into the external receptacle d' , as the pipe d^2 , and valve d^3 , so that the operation of vaporizing the oil and charging the inlet of air therewith may be made continuous, if desired. Furthermore this enables me to utilize this device for effecting the preliminary heating and vaporizing of the charges during the operation of starting the motor and before the mixing and combustion chambers have become thoroughly heated.

What I claim as my invention and desire to secure by Letters Patent is,

1. In a hydrocarbon motor of the character designated, the combination of a mixing chamber, a conduit for admitting air to said mixing chamber, a screen interposed between said air conduit and said mixing chamber, means for injecting hydrocarbon into said mixing chamber and against said screen, a drip collecting receptacle below and forming a continuation of said air conduit, and external

means for heating the drip in said collecting chamber, whereby the drip is vaporized and returned to the mixing chamber with the air supplied thereto, for the purpose described.

2. In a hydrocarbon motor of the character designated, the combination of a mixing chamber, a conduit for admitting air to said mixing chamber, a screen interposed between said air conduit and said mixing chamber, means for injecting hydrocarbon into said mixing chamber and against said screen, a drip-collecting receptacle below and forming a continuation of said air conduit, means for introducing a preliminary supply of hydrocarbon to said drip collecting chamber for use in effecting the preliminary starting of the motor, and external means for heating the hydro-carbon in said drip-collecting chamber whereby the said hydrocarbon is vaporized and caused to enter the mixing chamber with the air supplied thereto, for the purpose described.

3. In a hydrocarbon motor of the character designated, the combination of a mixing chamber, a conduit for admitting air to said mixing chamber, a screen interposed between said air conduit and said mixing chamber, means for injecting hydrocarbon into said mixing chamber and against said screen, a drip-collecting receptacle below and forming a continuation of said air conduit, a drip collecting receptacle in the mixing chamber below the said screen and communicating with the aforesaid drip collecting receptacle forming a continuation of the air conduit, and external means for heating the hydrocarbon in said latter drip receptacle, whereby the drip is vaporized and returned to the mixing chamber with the air supplied thereto, for the purpose described.

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