

L. W. WITRY.  
 COMBINED CHARGING AND FEEDING DEVICE FOR GASOLINE ENGINES.  
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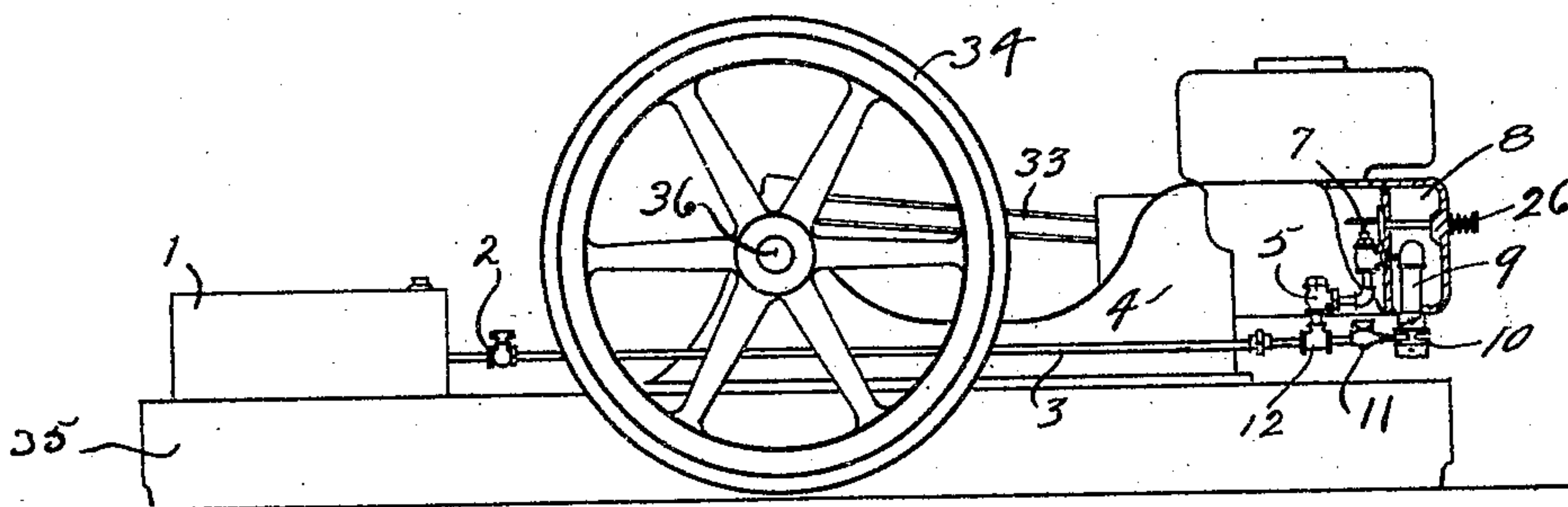


Fig. 1.

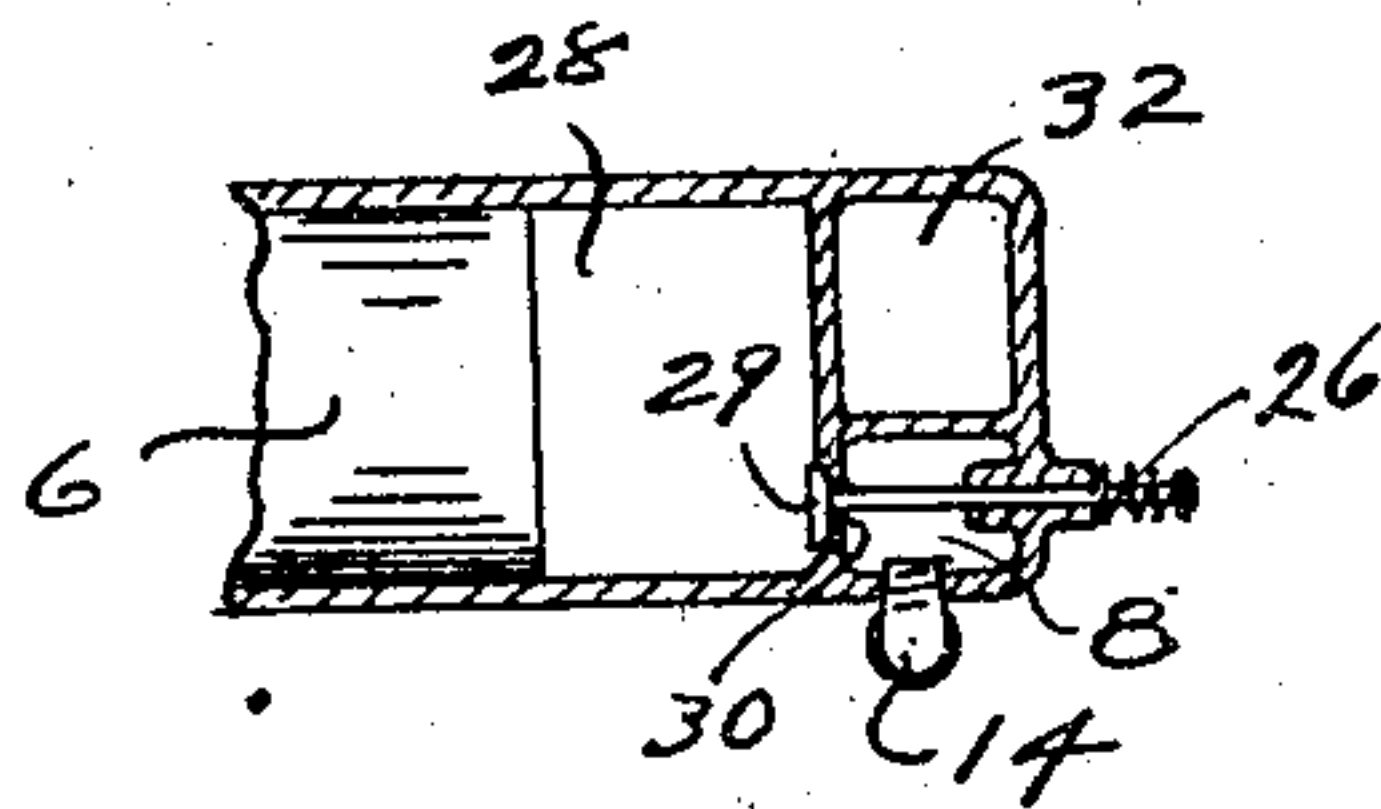


Fig. 3.

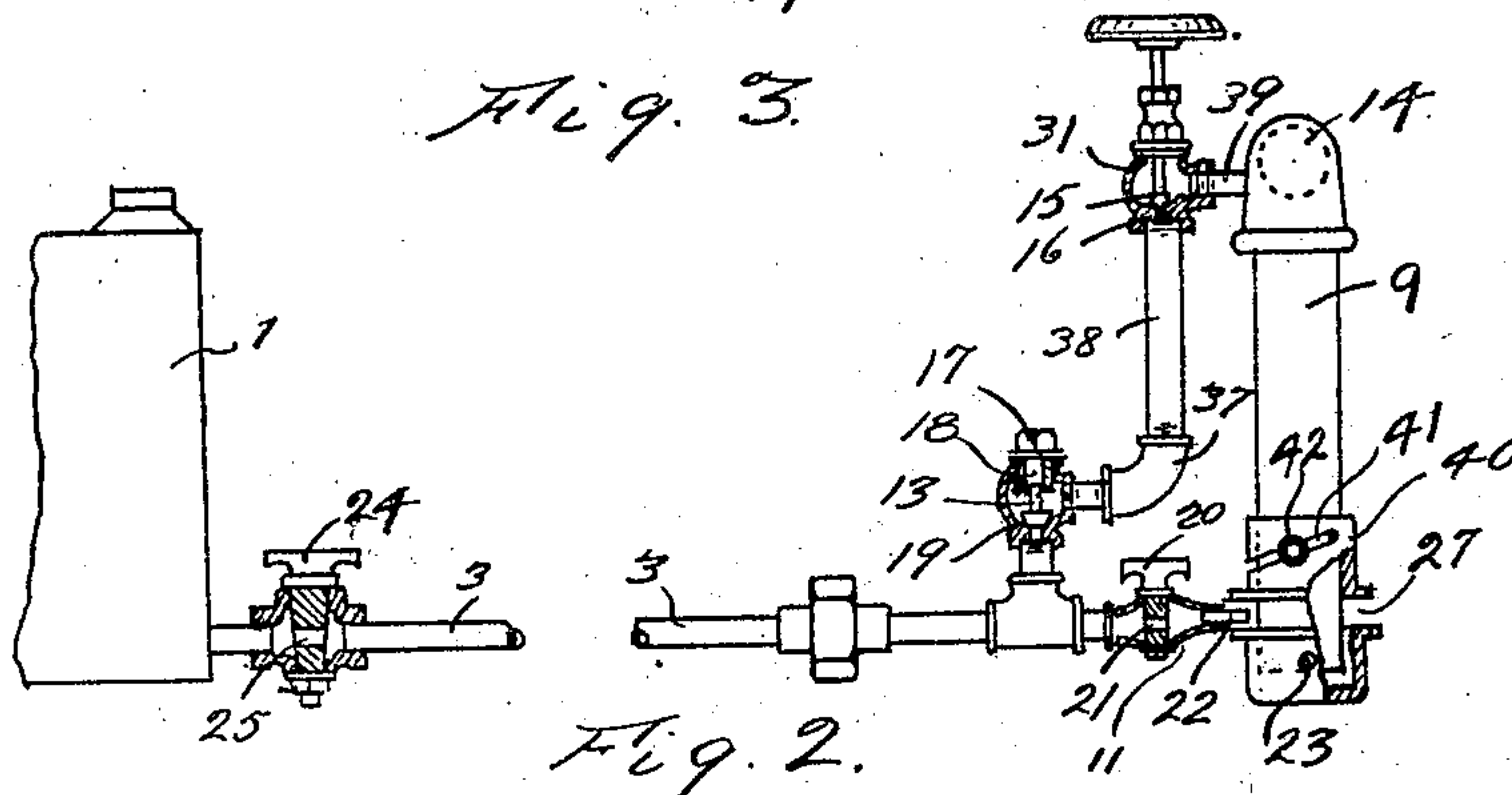


Fig. 2.

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# UNITED STATES PATENT OFFICE.

LOUIS W. WITRY, OF WATERLOO, IOWA, ASSIGNOR TO WATERLOO GASOLINE ENGINE COMPANY, OF WATERLOO, IOWA.

COMBINED CHARGING AND FEEDING DEVICE FOR GASOLINE-ENGINES.

979,238.

Specification of Letters Patent.

Patented Dec. 20, 1910.

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*To all whom it may concern:*

Be it known that I, LOUIS W. WITRY, a citizen of the United States of America, and a resident of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Combined Charging and Feeding Devices for Gasoline-Engines, of which the following is a specification.

My invention relates to improvements in combined charging and feeding devices for gasoline-engines, and the objects of my improvements are, first, to provide a sure and rapidly acting charging device for a gasoline engine supplied with adjustable regulating means for varying the location of the charging receptacle, and second, to so combine the said adjustable charging with a regular feeding device that the latter will be set automatically to supplying the engine with gasoline vapor as soon as said adjustable charging device has effected its function of providing for the starting thereof.

My invention herein is furthermore designed as an improvement upon the charging and feeding device which was patented by me in the United States of America on October 5, 1909, under Number 935,718.

The aforesaid objects I have accomplished by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a gasoline-engine equipped with my said improved combined adjustable charging means and communicating feeding device. Fig. 2 is an enlarged detail in partial section, with parts shown broken away, of said combined adjustable charging means and communicating feeding apparatus. Fig. 3 is a longitudinal section of the rear part of the engine cylinder, showing the gas inlet chamber and its retractile valve.

Similar numbers refer to similar parts throughout the several views.

The engine 4 rests on a base 35, and has the usual moving parts consisting of the piston 6, the pitman 33, crank-shaft 36, and a fly-wheel 34 mounted on said shaft. The compression-chamber 28 of the cylinder is separated from a rear water-cooling chamber 32 and an adjoining mixing-chamber 8.

A communication between the compression- and mixing-chambers is effected by means of an inlet-port 30 covered by a retractile valve 29 whose head is within said compression-chamber and is kept ordinarily over and closing said port by means of a tension-spring 26, the latter being coiled about the end of the valve-stem outside of the cylinder and bearing against the latter.

The air and gas are both introduced into the chamber 8 through an inlet in said cylinder wall into which is inserted the elbow-coupling 14, and the latter communicates with both said chamber 8 and the depending tube 9, the lower end of the latter being ordinarily open to the surrounding atmosphere. The open lower end of the tube 9 dips within but is spaced away from the bottom and the concentric walls of the cup 10, the said cup having a small orifice 23 at or near the lower edge of the tube 9. The cup 10 has an upwardly-extending sleeve 40 which is movably fitted about the lower portion of the tube 9. Said sleeve has openings 27 permitting communication between said cup 10 and the surrounding atmosphere. To permit of vertical adjustment of said sleeve 40 along the tube 9, an oblique slot 41 is provided in the sleeve, and a stud 42 extends into said slot from the said tube. A thumb-nut 43 is movably seated on the threaded outer end of said stud, and when tightened against the sleeve is adapted to hold the latter in a desired position of adjustment vertically along said tube. The adjustment is effected by merely turning the sleeve back or forward over said stud, thus lowering or lifting the cup 10 so as to keep it in a desired relation to the open lower end of said tube 9. The tube 9 may thus be dipped to varying depths within said cup to permit it to also dip into the gasoline charge in the cup to different distances to vary the speed of charging or the amount of the initial charge.

The numeral 1 designates a tank for gasoline whose top should be of sufficient height above the base 35 to afford enough head to the oil therein that the latter may quickly overcome the friction in the long pipe 3 especially in cool weather, and the level of such oil in the tank should be high



enough as to keep the different parts of the feeding device charged at all times as will be hereinafter described, except that the oil in the tank is always below the level of the valve-chamber 31 to prevent fluid oil being drawn therethrough instead of the vapor merely.

The pipe 3 leads from the tank 1 to a T-coupling 12, and the latter has a communication with an angle check-valve chamber 5, whose valve 19 operates to prevent the oil above it from returning back into the pipe 3 and tank 1. The stem 13 of said check-valve moves in a cylindrical bearing 18 depending from the removable cap 17. The valve-chamber 5 communicates with the valve-chamber 31 by means of an elbow-coupling 37 and pipe 38. The valve-chamber 31 contains a regulating- or throttle-valve 15 for the gasolene-vapor, the said valve operated by a hand-wheel 7 to bring it to a desired distance from its seat 16. The valve-chamber 31 communicates with the elbow-coupling 14 by means of a short pipe 39. A chamber 2 is inserted in the pipe 3 to contain an ordinary stop-cock 25 manually operated by means of a thumb-piece 24, when it is desired to shut off the flow of gasolene at times when inspection or repairs of the feeding or charging device is necessary. A valve-chamber 11 is in communication with the pipe 3 by way of the T-coupling 12, and contains an ordinary stop-cock 21 adapted to be manually operated by means of the thumb-piece 20. A short nozzle 22 leads from said valve-chamber 11 to and is adapted to deliver gasolene into the cup 10 through one of the openings 27.

When it is desired to operate the engine, the fly-wheel 34 is rotated to draw a charge of mingled gas and air through the port 30, chamber 8, and tube 9. The cup 10 has been previously adjusted vertically to a desired position relative to the lower end of the tube 9, and secured in the adjusted position by the tightening of the thumb-nut 43 against the sleeve 40. The stop-cocks 25 and 21 being opened, the cup 10 has been permitted to fill with gasolene until the gasolene appears at the orifice 23, when the cock 21 is shut off. The position of the orifice 23 is such that it permits the level of gasolene in the cup 10 to rise to the lower edge of the tube 9, the aforesaid adjusting of the vertical position of said cup varying a little the amount of dip of said pipe within the cup and its contained gasolene as desired for varying the richness of the vapor comprising the initial charge. As by the means described a charge of mingled gas and air is drawn into the cylinder, air which enters the openings 27 in said sleeve 40 is sucked through the gasolene covering the lower

edge of the tube 9 and the air is thus properly impregnated to a desired richness with gasolene vapor. The firing of this preliminary charge suffices to start the engine, which thereafter draws gasolene vapor through the chambers 8 and 31 from the chamber 5 regularly and automatically.

Provision is made in the cup 10 for only enough gasolene below the orifice 23 to supply one preliminary charge, and thereafter air only is drawn through the tube 9 from the openings 27 to mix in the chamber 8 with the vapor of gasolene drawn thereinto from the chambers 31, 5 and the pipe 3.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A combined charging and feeding device for a gasolene engine, composed in combination with a cylinder and a movable piston therein, said cylinder having an inlet-port and retractile means for closing the latter, of a mixing-chamber discharging into said port, a receptacle open to the atmosphere, a tube communicating between said receptacle and said mixing-chamber, means for varying the distance of said receptacle from the lower open end of said tube, a vessel containing a fluid hydrocarbon under a desired amount of head, means of communication between said vessel and said mixing-chamber, and between said vessel and said first-mentioned receptacle, and means for regulating the level of the hydrocarbon in said receptacle.

2. A combined charging and feeding device for a gasolene engine, composed in combination with a cylinder and a movable piston therein, said cylinder having an inlet-port and retractile means for closing the latter, of a mixing-chamber discharging into said port, a receptacle open to the atmosphere, a tube communicating between said receptacle and said mixing-chamber, means for varying the distance of said receptacle from the lower open end of said tube, a vessel containing a fluid hydrocarbon under a desired amount of head, means of communication between said vessel and said mixing-chamber provided with means for the regulation of the passage of the hydrocarbon there-through, and means of communication between said vessel and said receptacle.

3. A combined charging and feeding device for a gasolene engine, composed in combination with a cylinder and a movable piston therein, said cylinder having an inlet-port and retractile means for closing the latter, of a mixing-chamber discharging into said port, a receptacle open to the atmosphere, a tube communicating between said receptacle and said mixing-chamber, means for varying the distance of said receptacle from the open end of said tube, said tube

having its open end adapted to dip below  
the level of the contents of said receptacle,  
a vessel containing a fluid hydrocarbon un-  
der a desired amount of head, means of com-  
5 munication between said vessel and said  
mixing-chamber, and means of communica-  
tion between said vessel and said receptacle.

Signed at Waterloo, Iowa, this 31st day of  
March, 1910.

LOUIS W. WITRY.

Witnesses:

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