No. 676,403. Patented June 11, 1901.

G. J. WEBER.

OIL FEED FOR EXPLOSIVE ENGINES.

(Application filed Feb. 17, 1899.)

(No Model.)

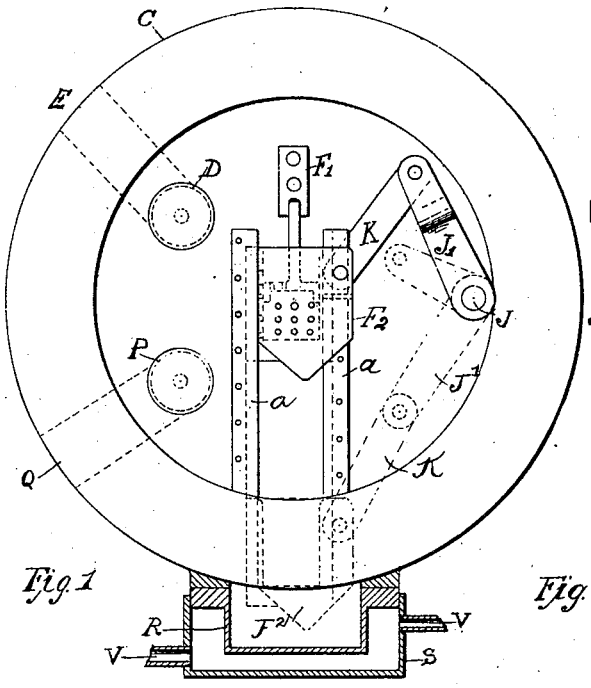

Fig. 1

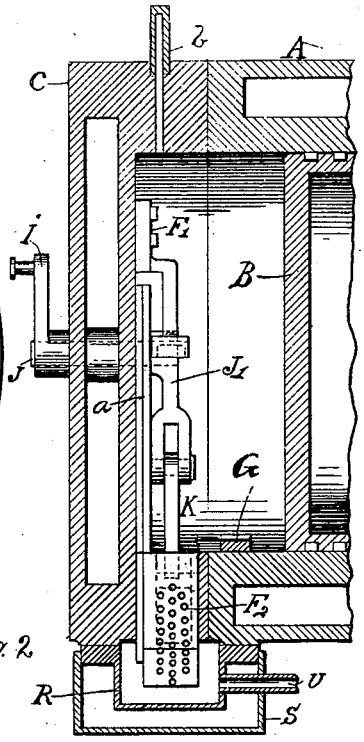

Fig. 2

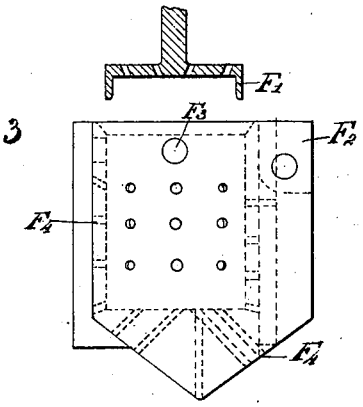

Fig. 3

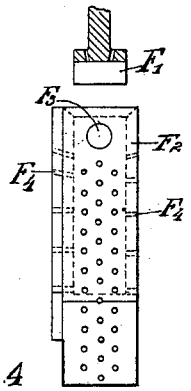

Fig. 4

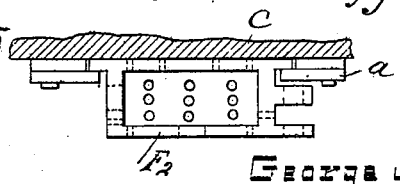

Fig. 5

WITNESSES:

Est. Benson

D. W. C. Hanes

INVENTOR

George J. Weber,

BY

Warren D. House,

His ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE J. WEBER, OF KANSAS CITY, MISSOURI.

OIL-FEED FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 676,403, dated June 11, 1901.

Application filed February 17, 1899. Serial No. 705,770. (No model.)

To all whom it may concern:

Be it known that I, GEORGE J. WEBER, a citizen of the United States, residing in Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Improvement in Dip-Feed Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in gas-engines.

It relates more particularly to the class of gas-engines in which power is imparted by the rapid combustion of fuel mixed with compressed air.

The object of my invention is to provide, in motors which utilize for the propulsive power gas evolved by the mixture of finely-divided fuel with compressed air, the mixture being exploded in a cylinder, a dipper that alternately enters the fuel-supply and the cylinder, means for compressing air in the cylinder, and a piston that enters the dipper for the purpose of forcing the fuel therefrom into contact with the compressed air.

It provides, further, means by which the fuel is ejected from the dipper in a finely-divided condition when the piston enters the dipper.

My invention provides, further, means by which the surplus fuel is removed from the exterior of the dipper.

My invention provides, further, a motor comprising a cylinder, a piston therein, means for compressing air within the cylinder, and a dipper that alternately enters a fuel-supply and the cylinder and discharges its contents within the cylinder. The entrance direct of the dipper into the cylinder causes the dipper to be highly heated, which heat being communicated by contact therefrom to the contents thereof produces more perfect combustion of the fuel and increases thereby the efficiency of the motor.

My invention comprises, further, in combination, the cylinder, of a dipper reciprocally mounted in the cylinder and adapted to enter the fuel-supply, means for reciprocating the dipper, an igniting device, and a piston adapted to enter and force the fuel from the dipper in a finely-divided condition against the air previously compressed in the cylinder.

My invention provides, further, certain novel features of construction hereinafter fully described and claimed.

In the accompanying drawings, illustrative of my invention, Figure 1 represents an inner elevation view of the cylinder-head with the fuel-receptacle shown in vertical section. In this view the dipper is shown in the elevated position in solid lines and in the lower position in dotted lines. Fig. 2 represents a vertical sectional view, showing the dipper in the lower position. Fig. 3 represents a front elevation view of the dipper with a portion of the dipper-piston shown in section immediately above. Fig. 4 represents an elevation view of the dipper from one side, the dipper-piston being shown above in section. Fig. 5 represents a top view of the dipper with the link removed and a portion of the cylinder-head shown in cross-section.

Similar letters of reference indicate similar parts.

A indicates the cylinder, B the piston, and C the cylinder-head.

D and P indicate, respectively, the inlet and exhaust valves, the ports leading therefrom being shown in dotted lines and indicated by E and Q, respectively. Upon the inner end of the cylinder-head are two vertical strips *a*, which serve as guides for a dipper F^2, reciprocally mounted in the said guides and provided with fuel-ejection openings F^3 and F^4, which lead from the interior of the dipper to its outer periphery. Secured to the same side of the cylinder-head and above the guides *a* is a piston F′, so disposed as to enter the open upper end of the dipper F^2 for the purpose of forcing out through the openings F^3 and F^4 the liquid fuel previously dipped up from the supply of liquid fuel contained in a fuel-receptacle R, secured to the under side of the cylinder and communicating interiorly with the same below the guides *a*. From some source of supply the fuel-receptacle R is replenished through a pipe U. Surrounding the receptacle R, with a space between, is a water-jacket casing S, provided with circulating-pipes V for admitting and passing out water. Extending through the cylinder-head and rotatable in a bearing provided with suitable means for packing against leakage is a rock-shaft J, to the inner end of

which is secured a crank-arm J′ and to the outer end of which is secured a crank-arm I. A link K is pivotally connected at its ends to the crank J′ and the dipper F^2, respectively.

My invention is operated as follows: Upon the piston B starting on its outward stroke the valve D opens, allowing ingress into the cylinder of air, and the valve is closed at the end of the stroke, so that on the return instroke the air becomes compressed. During the instroke the dipper F^2 is elevated through the rocking of the shaft J and the intermediacy of the link K and crank-arm J′, and at the time the piston reaches the inner end of the stroke the dipper-piston F′ enters the open upper end of the dipper F^2 and forces out through the openings F^3 and F^4 the fuel-oil contained in the dipper. This is accomplished very suddenly, and the oil is sprayed into the cylinder in a finely-divided state and is then ignited by any desirable means commonly used—as, for instance, a heated tube, (indicated in the drawings by *b*.) The explosion of the mixture then forces the engine-piston B outward on the power-stroke, at the end of which the valve P opens and permits the passage from the cylinder of the burned gas. By the entrance of the fuel-dipper into the cylinder the oil or other fuel is subjected to a high degree of heat during and prior to its expulsion in a spray from the dipper. In addition to the direct action of the heated gas in the cylinder a large amount of heat is imparted by conduction from the body of the dipper to the fuel by reason of the high temperature of the dipper due to its entrance into the cylinder at each reciprocation.

Any desirable means may be employed to rock the shaft J at the proper time.

A brush G, comprising a bunch of wires secured together at one end to the inner periphery of the cylinder, is so disposed therein that the free ends of the wires will scrape over the forward face of the dipper and sweep therefrom the surplus oil.

I do not confine myself to the pattern of brush illustrated, as any device serving to sweep off the surplus oil from the outer periphery of the dipper would be included in my invention.

Various other modifications may be employed in the different parts of the apparatus from those shown while retaining the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a gas-engine, the combination with the cylinder, of a dipper which alternately enters the cylinder and a liquid-fuel supply, means for compressing air in the cylinder, and means for ejecting the liquid fuel from the dipper into the cylinder, substantially as described.

2. In a gas-engine, the combination with the cylinder, of a fuel-receptacle, a dipper adapted to alternately enter the said receptacle and the cylinder, means for compressing air in the cylinder, and a piston adapted to enter the dipper for forcing the fuel therefrom, substantially as described.

3. In a gas-engine, the combination with the cylinder, of a dipper adapted to bring fuel therein, and a device adapted to enter the dipper and force the fuel therefrom, substantially as described.

4. In a gas-engine, the combination with the cylinder, of a dipper provided with a recess adapted to contain liquid fuel, and a device in the cylinder adapted to enter the said recess for the purpose of ejecting the fuel therefrom, substantially as described.

5. In a gas-engine, the combination with the cylinder, of a dipper provided with a recess for containing liquid fuel, and having a discharge opening or openings leading therefrom to the exterior of the dipper, and a device adapted to enter the said recess for forcing out the fuel, substantially as described.

6. In a gas-engine, the combination with the cylinder, of a liquid-fuel receptacle, a dipper which alternately enters the said receptacle and the cylinder, and means for discharging the liquid fuel from the dipper into the cylinder in the form of a fine spray, substantially as described.

7. In a gas-engine, the combination with the cylinder, of the piston, a dipper which alternately enters a fuel-supply and the cylinder, and means for ejecting the fuel from the dipper into the cylinder when the piston is in the proper position, substantially as described.

8. In a gas-engine, the combination with the cylinder, a fuel-receptacle adapted to contain a liquid fuel, a dipper reciprocally mounted and adapted to alternately enter the fuel-receptacle and the cylinder, means for reciprocating the dipper, and a piston for ejecting the contents of the dipper into the cylinder, substantially as described.

9. In a gas-engine, the combination with the cylinder, of a fuel-dipper reciprocally mounted therein, a rock-shaft provided with a crank, a link connecting the said crank with the dipper, and a piston adapted to enter the dipper for the purpose of displacing the fuel therein, substantially as described.

10. In a gas-engine, the combination with the cylinder, of a fuel-dipper adapted to bring fuel into the cylinder, a rock-shaft provided with a crank-arm, a link connecting the crank-arm with the dipper, means for rocking the said rock-shaft, and a piston adapted to enter the dipper for the purpose of forcing therefrom the fuel carried therein, substantially as described.

11. In a gas-engine, the combination with the cylinder, of a piston reciprocally mounted therein, an igniting device connected with the cylinder, a fuel-dipper which alternately enters a fuel-supply and the cylinder, and a de-

vice for spraying the fuel from the dipper into the cylinder at the proper time, substantially as described.

12. In a gas-engine, the combination with the cylinder, of a fuel-supply, a dipper adapted to dip into the said supply and then pass into the cylinder, and means for removing the surplus fuel from the exterior of the dipper, substantially as described.

13. In a gas-engine, the combination with the cylinder, of a fuel-supply, a dipper adapted to dip therein and then enter the cylinder, and a brush for removing the surplus fuel from the exterior of the dipper, substantially as described.

14. In a gas-engine, the combination with the cylinder, of a fuel-receptacle, a dipper provided with a recess and openings leading therefrom to the periphery of the dipper, and adapted to enter the fuel-receptacle and then the cylinder, and a piston in the cylinder adapted to enter the said recess so as to force the fuel from the recess out the said openings into the cylinder, substantially as described.

15. In a gas-engine, the combination with the cylinder, of the cylinder-head a dipper reciprocally mounted upon the head, a piston secured upon the head and adapted to enter the dipper, means for reciprocating the dipper, and a fuel-supply in which the dipper is adapted to enter, substantially as described.

16. In a gas-engine, the combination with the cylinder, of the piston reciprocally mounted therein, the cylinder-head, a dipper reciprocally mounted thereon, a piston adapted to enter the dipper, means for reciprocating the dipper, a fuel-supply in which the dipper enters, and an igniting device for igniting the mixed fuel and air in the cylinder, substantially as described.

In testimony whereof I have hereunto affixed my signature in presence of two witnesses.

GEORGE J. WEBER.

Witnesses:
WARREN D. HOUSE,
JULIUS J. KARGES.