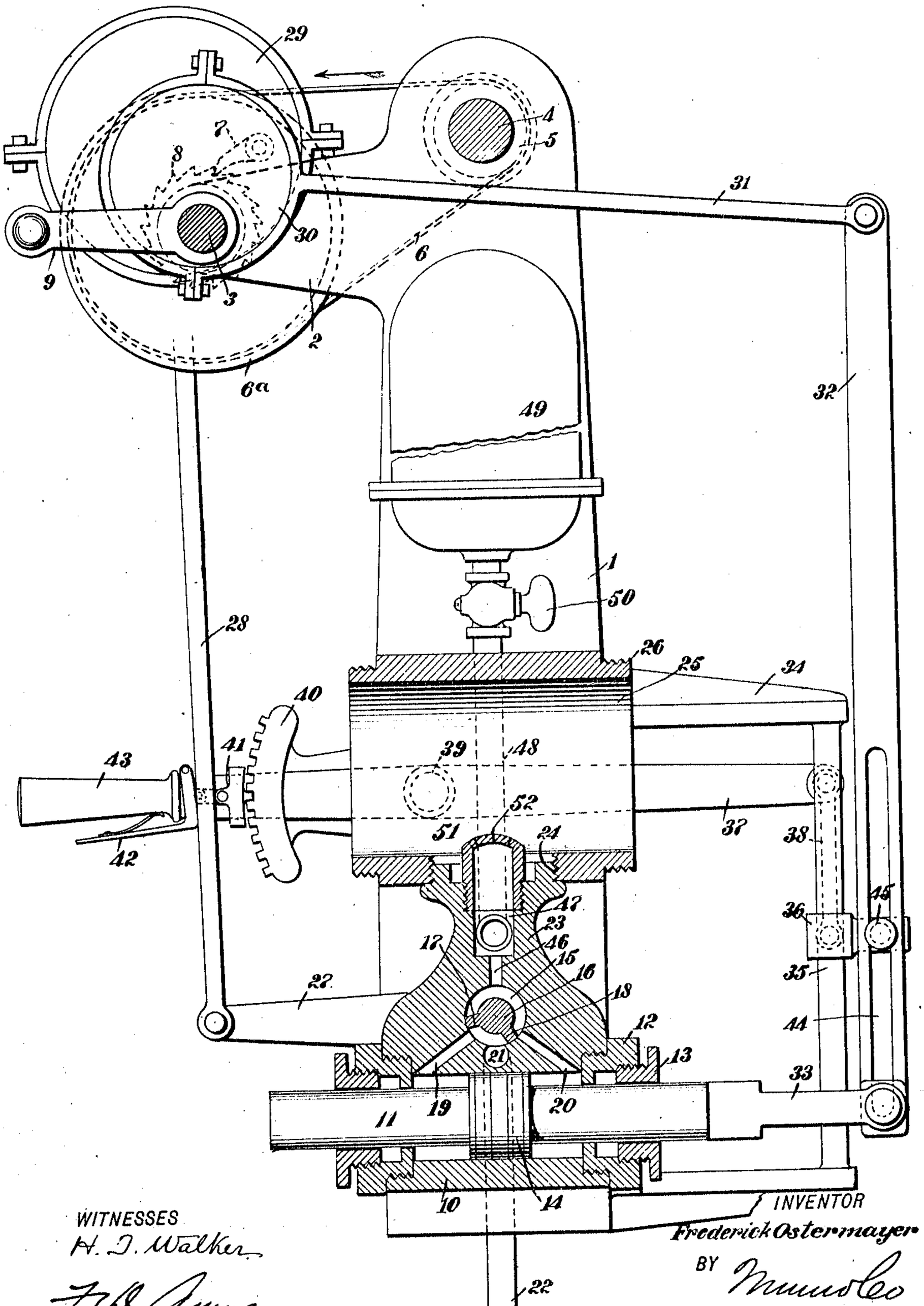
F. OSTERMAYER.

CARBURETING APPARATUS.

APPLICATION FILED JUNE 10, 1909.

970,102. Patented Sept. 13, 1910.



WITNESSES

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CARBURETING APPARATUS.

970,102 Specification of Letters Patent. **Patented Sept. 13, 1910.**

Application filed June 10, 1909. Serial No. 501,287.

To all whom it may concern:

Be it known that I, FREDERICK OSTERMAYER, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented a new and Improved Carbureting Apparatus, of which the following is a full, clear, and exact description.

This invention relates to carbureting apparatus, and is intended especially to be used in connection with gas engines.

The object of the invention is to provide simple carbureting mechanism in which the degree of carburization of the air can be regulated independently of the speed of the engine, although the mechanism producing the feed is driven positively from the mechanism of the engine so as to constitute a forced feed. In the operation of the apparatus, the liquid fuel is forced through a nozzle having fine perforations so that the fuel is atomized into the air current passing to the engine cylinder.

The invention concerns itself with the means of driving and controlling the operation of the pump by means of which the fuel is forced through the nozzle.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claim.

Reference is to be had to the accompanying drawing forming a part of this specification, in which similar characters of reference indicate corresponding parts, and in which the figure is a partial section through the mechanism, the said section being taken through the pump cylinder and through the mixing chamber.

Referring more particular to the parts, 1 represents the frame of the mechanism which may include a projecting bracket 2 supporting the counter-shaft 3. The engine shaft 4 may be supported in the upper part of the frame 1 as indicated, and is provided with a belt pulley 5 over which a belt 6 passes. This belt passes on a larger belt pulley 6^a which is loose on the shaft 3. On the face of this pulley a pawl 7 is provided which meshes with a ratchet wheel 8 rigid on the shaft 3, so that when the belt is driven in the direction of the arrow, the shaft 3 will be rotated as will be understood. The shaft 3 is provided with a crank 9 which enables it to be rotated directly by hand if desired. In the lower part of the frame 1 a pump cylinder 10 is formed and the piston 11 of this pump passes through removable heads 12 which screw into the ends of the cylinder as shown. These heads are provided with stuffing boxes 13 for packing the piston as will be readily understood. Near its middle point, the piston 11 is provided with a piston head 14 which is suitably packed as shown. Above the cylinder, a transverse bore 15 is formed, which constitutes a valve chest for a rotary valve 16. This valve has a cylindrical body with radially projecting wings 17 and 18. From the valve chest 15 a port 19 extends to the left end of the cylinder and a port 20 extends to the right end of the cylinder. Between these ports an admission port 21 is formed which is connected with a fuel supply pipe 22 as indicated. The valve chest 15 is formed in the housing 23 which may be integral with the cylinder and disposed above the same as indicated. This housing is formed with a threaded neck 24 upon which a tubular mixing chamber 25 is attached, the ends of this mixing chamber being provided with screw threads 26 to enable the pipe sections to be attached to carry the air to the engine cylinder.

In order to rock the valve 16 it is rigidly attached to an arm 27 which extends longitudinally with the axis of the pump cylinder 10 as shown. This arm 27 is connected at its end with an eccentric rod 28 which extends upwardly to an eccentre 29 on the shaft 3. A similar eccentric 30 is provided on the shaft 3 and from this eccentric 30 a rod 31 extends over to a main lever 32. This main lever is disposed in a substantially vertical position and its lower end is pivotally connected to an extension 33 projecting from the end of the piston 11. The frame 1 is formed with horizontally projecting bracket arms 34 between which a vertical guide bar 35 is formed, and on this guide bar 35 a slide block 36 may be moved up and down by means of a lever 37 connected to the same by a link 38. This lever is pivoted at 39 on the side of the frame and may be held fixed in any adjusted position by means of a segment 40 having a locking mechanism 41 coöperating therewith. This locking mechanism is operated by a finger lever 42 disposed near the handle 43 of the lever, as shown. By means of the lever 37 the block 36 may be slid along the guide bar so as to regulate the stroke of the pump. In this

connection, attention is called to a longitudinal slot 44 which is formed in the lever 32. The block 36 is provided with a pin 45 which passes through this slot and constitutes a fulcrum for the lever 32 when it swings. From the upper side of the valve chest 15 a delivery port 46 passes and this port opens out into a delivery chamber 47 from which a pipe 48 extends upwardly to an air chamber 49. In the pipe 48 is a stop-cock 50 which may cut off communication with the air chamber when desired.

Just above the chamber 47 a nozzle 51 is provided, said nozzle being of tubular form and having a crowned head with three perforations 52 therein as indicated. These perforations open on the interior of the mixing chamber 25 and are very small so that when the fuel is forced through them it becomes atomized in the current of air passing through the mixing chamber.

The mode of operation of the apparatus will now be described:

When the valve 16 is in the position shown, the pump piston 11 will be moving toward the right. On this stroke, fuel will be drawn up through the pipe 22 through the ports 21 and 19 to the left end of the cylinders. At the same time the fuel in the right end of the cylinder will be forced out through the ports 20 and 46 so as to be forced through the nozzle 52. If the lever 37 is adjusted so as to hold the slide block 36 at its most elevated point, that is, near the upper end of the slot 44, the pump will then have the maximum possible stroke and will be giving the greatest possible feed of fuel through the nozzle. On the other hand if the slide block 36 is moved down to its lowest possible position, then the amount of movement of the pump piston can be made very slight, so as to give practically no feeding effect. In this way, I am enabled to give the pump a variable stroke, and the length of this stroke is independent of the speed of the engine. The pump can exert a considerable force in advancing the fuel and can be used, if desired, to draw the fuel up from a fuel reservoir, which is in a depressed position. Whatever be the length of stroke of the pump, the valve 16 would be rocked backward and forward so as to open one side of the cylinder, to the nozzle first, and then the other side. When the engine reverses, it does not affect the pump on account of the ratchet and pawl connection in the driving mechanism of the pump. Furthermore, on account of the ratchet and pawl connection it is evident that the pump can be driven when desired, by means of the crank 9. On account of the air chamber 49 the flow through the nozzle is made more uniform and steady, which is desirable.

Special attention is called to the ratchet and pawl 7 through which the pump is driven from the engine, and to the fact that with this construction the reversal of the engine practically disengages the pump. This is advantageous because the work necessary to drive the pump is thrown upon the engine when the engine is reversed. In this connection it should be remembered that in automobiles where the engine is reversed it is usually not necessary to develop great power, but simply to move the vehicle slightly to the rear. Cutting out the pump in this manner is therefore advantageous, and the supply of fuel in the carbureter and feed pipes will be sufficient to supply the engine for the short period during which it runs in a reverse direction.

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

Mechanism for supplying explosive mixture to internal combustion engines, comprising a tubular mixing chamber, through which air may pass, a pump disposed below said chamber and including a cylinder and a bracket extending upwardly and connected to said mixing chamber, a nozzle within said mixing chamber and having passages connected to opposite ends of the cylinder, a valve for controlling the communication through said passages, a piston within said pump, a frame connected to said cylinder and said mixing chamber, a slide block guided by said frame and having a fulcrum pin, a lever having a slot engaging with said fulcrum pin and connected to said piston, an engine shaft, and means for driving said lever from said engine shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK OSTERMAYER.

Witnesses:

MARY OSTERMAYER,

ROSINE SCHWEITZER.