No. 800,647. PATENTED OCT. 3, 1905.

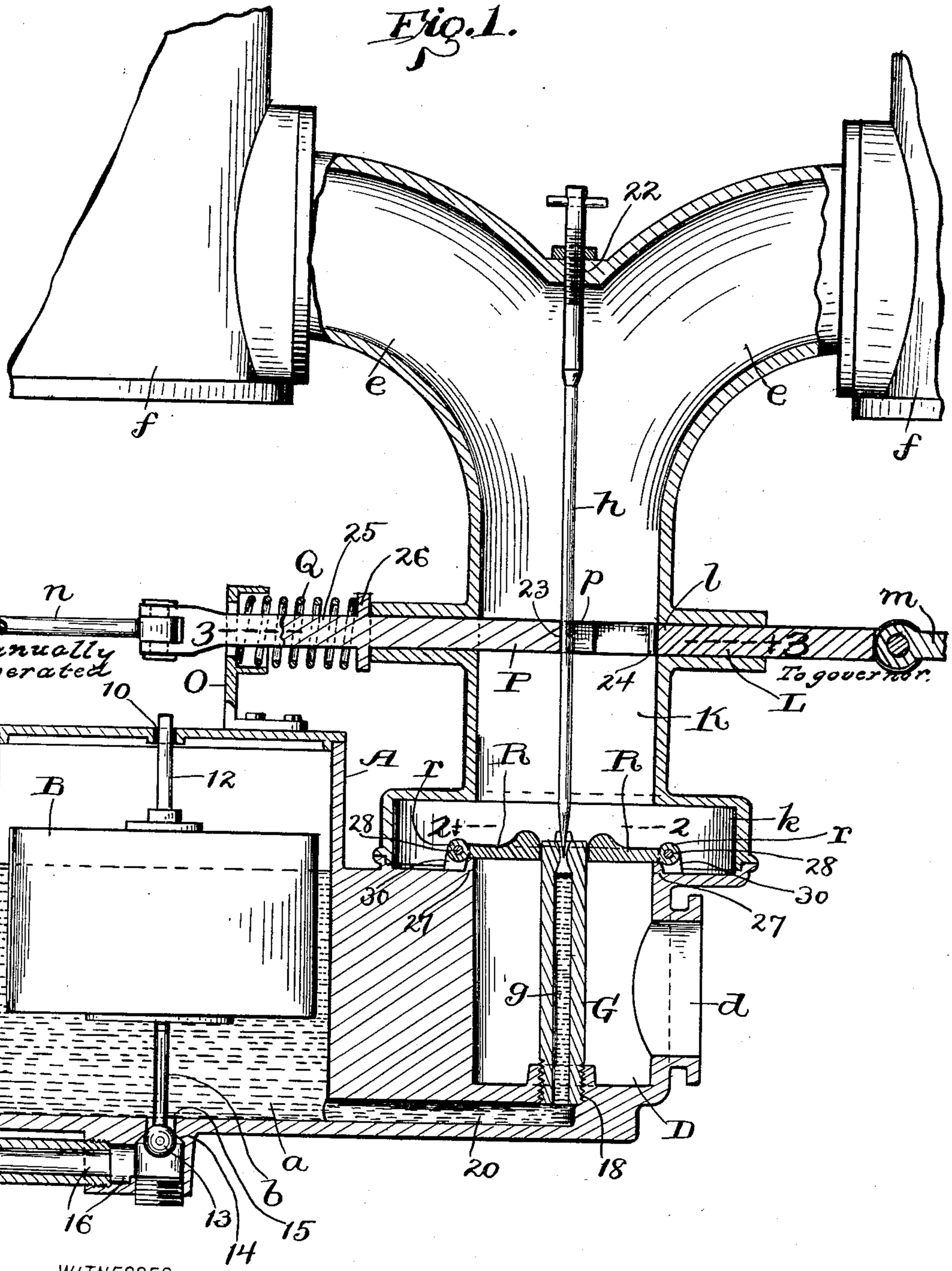
# W. A. HATCHER.

## CARBURETER.

APPLICATION FILED FEB. 23, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

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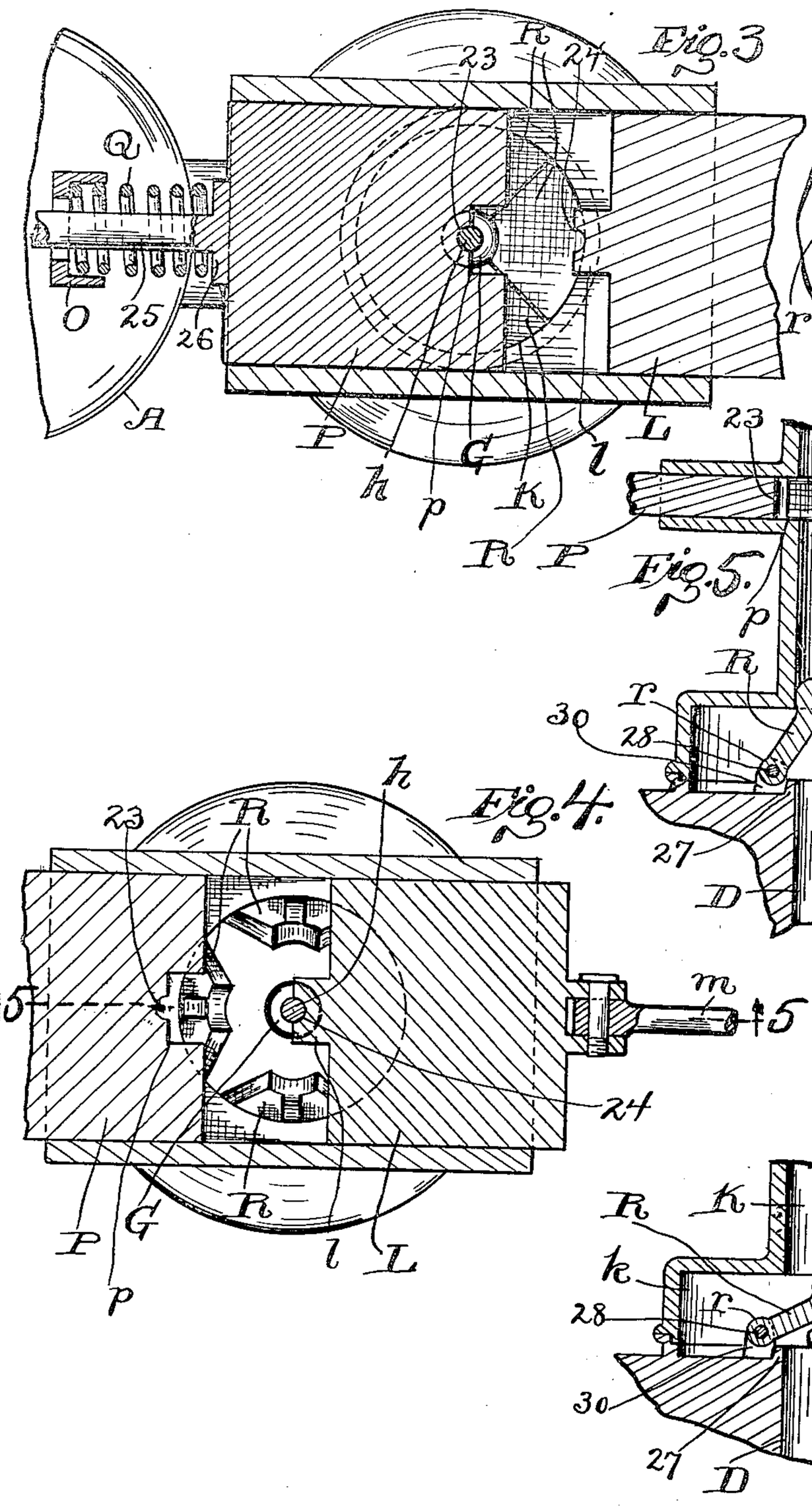


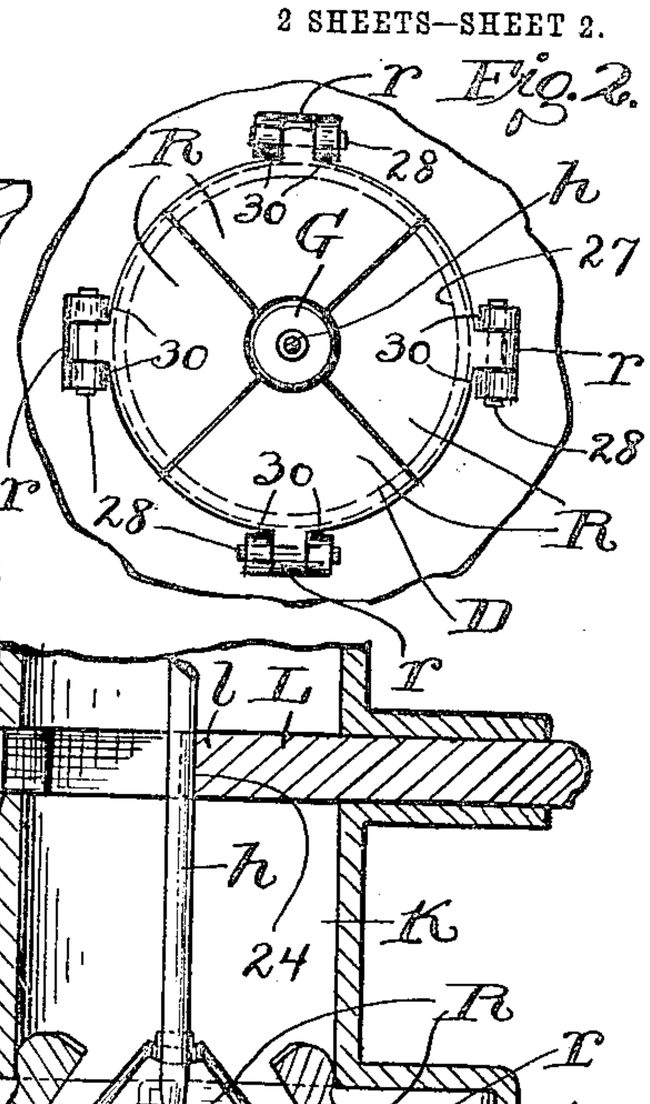





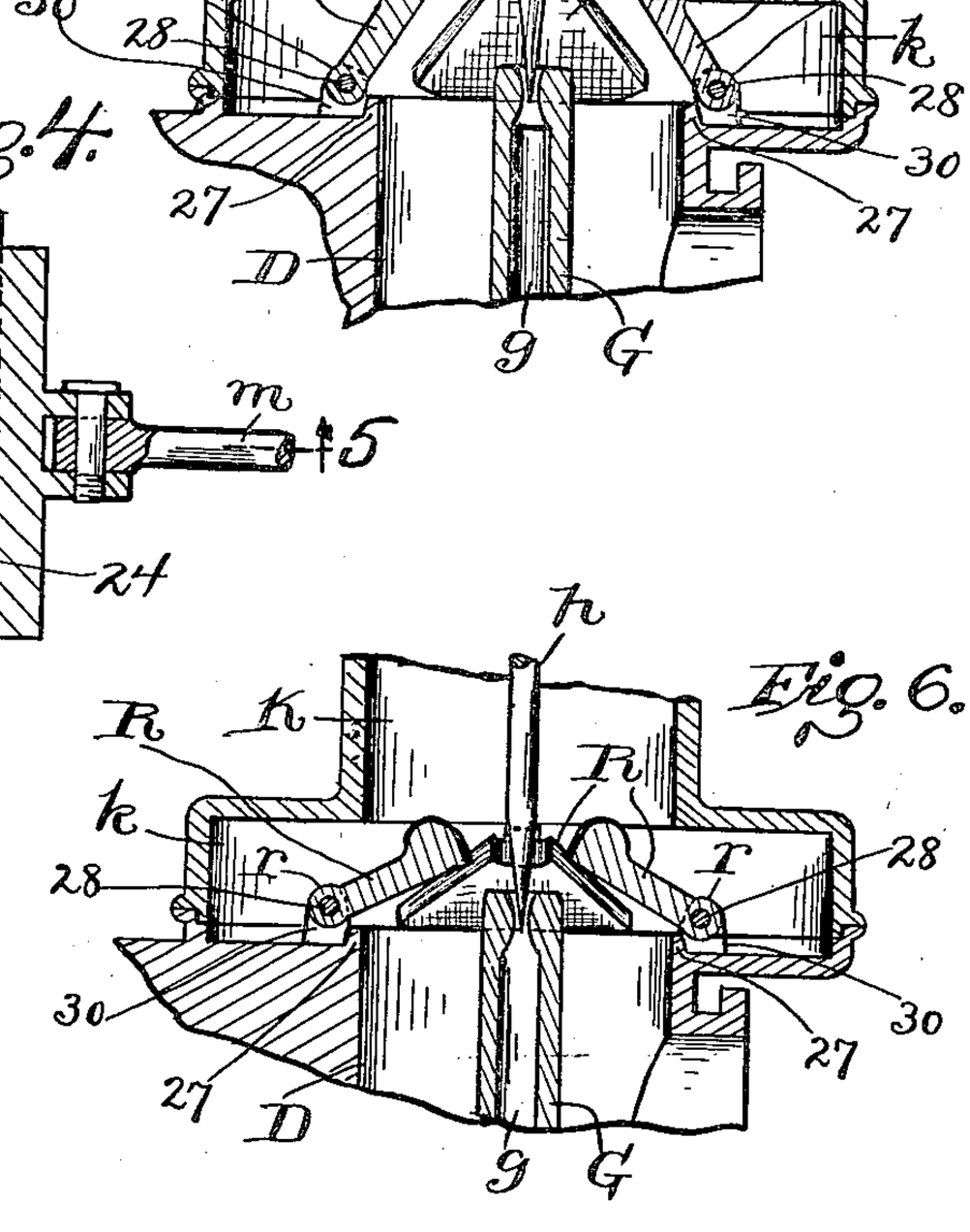





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# UNITED STATES PATENT OFFICE.

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## CARBURETER.

No. 800,647. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed February 23, 1905. Serial No. 246,934.

*To all whom it may concern:*

Be it known that I, WILLIAM A. HATCHER, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Carbureters; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in carbureters more especially designed for use in connection with an internal-combustion engine.

The primary object of this invention is to positively insure an adequate and suitable feed of a suitable mixture of air and oil to the passage-way employed in feeding the said mixture in an aeriform state to the cylinder of an internal-combustion engine at all times regardless of the speed of the engine.

Another object is to provide a carbureter which is simple in construction and reliable in its operation.

Another object is to provide a meritorious combination of my improved carbureter relative to the feed passage-ways employed in conducting the combustible mixture to the different cylinders of an internal-combustion engine having a plurality of cylinders.

With these objects in view this invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation largely in central section, illustrating my improved carbureter and the adjacent portions of two engine-cylinders with which the carbureter is connected. Fig. 2 is a section on line 2 2, Fig. 1, looking downwardly. Fig. 3 is a section on line 3 3, Fig. 1, looking downwardly. Fig. 4 is a section and corresponding in the main with Fig. 3, except that in Fig. 4 the cut-off or valve L instead of the cut-off or valve P of the two cut-offs or valves which control the passage of the combustible mixture through the mixing-chamber of the carbureter is shown in its closed position, and the flap-valves which control the passage of air from the air-chamber to the mixing-chamber are shown open. Fig. 5 is a central vertical section on line 5 5; Fig. 4. Fig. 6 is a vertical section showing the discharging end of the air-chamber of the carbureter, the adjacent portion of the mixing-chamber, and the aforesaid flap-valves partially open.

Referring to Fig. 1 of the drawings, A indicates an oil-reservoir, and *a* a body of gasolene or hydrocarbon-oil within the said reservoir. Within the chamber of the reservoir A is arranged a vertically-movable float B, which is provided at the top and centrally with a guide-forming stem 12, which projects vertically through a vent-hole 10, formed in and centrally of the top of the reservoir. The float B is provided at the bottom and centrally with a depending stem *b*, which terminates at its lower end in a valve-forming head 13, which is arranged to engage an annular seat 14, formed around the lower end of the oil-inlet 15 of the chamber of the reservoir A, which inlet is formed in the bottom of the said chamber and connects with the oil-supply passage-way 16, arranged below the reservoir. The valve 13 closes the inlet 15 or establishes communication between the said inlet and the passage-way 16, according as the float B is in its uppermost or below its uppermost position. In Fig. 1 of the drawings the reservoir A contains enough oil *a* to hold the float B in its uppermost position. At one side and externally of the reservoir A is formed an air-chamber D, which is provided at one side with an air-inlet *d*, which communicates with the external atmosphere. A pipe G is arranged vertically and centrally of the chamber D and extends through the said chamber. The pipe G is externally screw-threaded at its lower end and screwed into a correspondingly-screw-threaded hole 18, formed in the bottom of the chamber D. The passage-way *g*, formed in and extending through the pipe G, communicates at its lower end with one end of a horizontal passage-way 20, which communicates at its opposite end with the chamber of the reservoir A. Above the air-chamber D is formed a mixing-chamber K, which is enlarged at its lower end, as at *k*, next above and around the upper end of the air-chamber. The discharge of oil from the upper and discharging end of the passage-way *g* is controlled by a needle-valve *h*, which is arranged vertically and centrally of and ex-

tends through the mixing-chamber K. The mixing-chamber K discharges into two upwardly-diverging passage-ways *e*, arranged above the said chamber, which passage-ways feed the aeriform combustible mixture formed in the said chamber to different cylinders *f*, respectively, of an internal-combustion engine. The valve *h* is applied in any approved manner and is shown screw-threaded at its upper end and engages a correspondingly-screw-threaded hole 22, formed in and centrally of the top of the casing which forms the passage-ways *e*. The passage of the combustible mixture through the mixing-chamber K is controlled by two cut-offs or slide-valves L and P, which are movable toward or from each other and supported in any approved manner. The valve L is arranged at one side of the needle-valve *h*, and the valve P is arranged to operate in the main at the other side of the needle-valve. The valves L and P are arranged horizontally and are preferably supported by and extend externally of opposite sides, respectively, of the surrounding wall of the mixing-chamber K. The valve P is large enough in dimensions to render it capable of projecting past or beyond the needle-valve *h* in the direction of the valve L when the valve P is in its closed position. The valve P is provided at its inner side edge and centrally with a recess *p* and is provided centrally of the central wall of the said recess with a groove 23, arranged to be engaged by the needle-valve *h* in the closed position of the valve P, as shown in Fig. 3. The valve L is provided at and centrally of its inner side edge with a tongue *l*, which projects in the direction of the valve *h*, which tongue is provided centrally with a groove 24, which is arranged to be engaged by the needle-valve *h* in the closed position of the valve L, as shown in Fig. 4.

Obviously if both valves L and P were closed at the same time the tongue or projecting portion *l* of the valve L would engage the recess *p* in the valve P. Obviously, also, the mixing-chamber K is uncovered more when the valve P is only open than when the valve L is only open.

The valve L is operatively connected with the governor-operated rod *m*, which is operatively connected with the governor (not shown) of the engine. The valve P is provided with a stem 25, which extends loosely through a bracket O, which is secured to the top of the reservoir A, and the said stem is operatively connected with a manually-operated rod *n*. A spiral spring Q, which is mounted on the stem 25, is confined between the bracket O and a shoulder 26, formed on the inner end of the said stem, and acts to retain the valve P in its closed position. The valve P is therefore normally closed and the valve L is normally open; but obviously the valve L, being operatively connected with the governor, (not shown,) will begin to close as soon as a certain speed of the engine has been attained. It is obvious, therefore, that when excessive speed is desired the valve P is opened.

As already indicated, the primary object of this invention is to provide an adequate and suitable feed of oil and air into the mixing-chamber at all times, and to accomplish this object several flap-valves R are arranged within the lower and laterally-enlarged portion *k* of the mixing-chamber K and around the upper end of the pipe G and normally cover or close the upper end of the air-chamber D. In the carbureter illustrated four valves R, in the form of segmental sections, are hinged or pivotally connected to the bottom of the mixing-chamber K externally of the air-chamber D and arranged to swing upwardly. The valves R normally rest upon an annular rim 27, formed around the upper end of the chamber D. The rim 27 prevents the valves R from swinging downwardly beyond their closed and normal position in moving from their upwardly-swung and open position into their closed and normal position. Each valve R is provided at the outer side of the rim 27 with a laterally and outwardly projecting lug *r*, which is pivoted, as at 28, horizontally and at a right angle to the valve *h* to a lug or lugs 30, formed upon and projecting upwardly from the bottom of the enlarged portion *k* of the mixing-chamber.

It will be observed that the valves R open more or less, according as the suction which is created within the mixing-chamber K when one or both of the valves L and P are open during the operation of the pistons (not shown) within the engine-cylinders *f* increases or decreases, and that the said valves close by gravity upon a complete cessation of the operation of the engine. It will be observed that when the valves R are full open, as shown in Fig. 5, they strike the surrounding wall of the chamber K at the top of the enlarged lower portion *k* of the said chamber, and the arrangement of the parts is such that the valves R in their full open position project upwardly and inwardly, so that there is no liability of the said valves being swung open too far, and thereby being prevented from closing again by gravity. The valves R when full open will gradually swing downwardly with a decrease in the suction within the mixing-chamber K, and the passage of the air from within the air-chamber D upwardly around the discharging end of the passage-way *g* becomes more restricted and confined around and in close proximity to the said passage-way, as desired.

Obviously when the valves R are less than full open—as shown, for instance, in Fig. 6—the air rushing upwardly from the air-chamber D around the upper and discharging end

of the pipe G passes with the desired velocity in close proximity to the discharging end of the passage-way *g* and operates to maintain a suitable feed of oil from the said passage-way.

What I claim is—

1. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber having an air-inlet and arranged a suitable distance below the aforesaid passage-way; a mixing-chamber located between the air-chamber and the said passage-way and arranged to discharge into the said passage-way; means for controlling the discharge of the combustible mixture from the mixing-chamber to the said passage-way; an oil-conducting pipe arranged centrally of the air-chamber and discharging into the mixing-chamber, which pipe is externally screw-threaded at its lower end and screwed into the bottom of the air-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the said pipe, and several suitably-supported flap-valves normally covering the air-chamber and arranged to be swung into the mixing-chamber by suction created within the mixing-chamber.

2. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber having an air-inlet and arranged a suitable distance below the aforesaid passage-way; a mixing-chamber located between the air-chamber and the said passage-way and arranged to discharge into the said passage-way; means for controlling the discharge of the combustible mixture from the mixing-chamber to the said passage-way; an oil-conducting passage-way arranged centrally of the air-chamber and discharging upwardly into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, and suitably-supported flap-valves normally covering and arranged radially of the air-chamber in position to be swung upwardly and outwardly by suction created within the mixing-chamber.

3. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber having an air-inlet and arranged a suitable distance below the aforesaid passage-way; a mixing-chamber located between the air-chamber and the said passage-way and arranged to discharge into the said passage-way; an oil-conducting passage-way arranged centrally of the air-chamber and discharging upwardly into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, and suitably-applied flap-valves normally covering and arranged radially of the air-chamber in position to be swung upwardly and outwardly by suction created within the mixing-chamber, and a rim formed around the upper end of the air-chamber and affording a bottom bearing to the flap-valves.

4. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber having an air-inlet; a mixing-chamber located between the air-chamber and the said passage-way and arranged to discharge into the said passage-way; an oil-conducting passage-way arranged centrally of the air-chamber and discharging into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, suitably-applied flap-valves normally closing the discharging end and arranged radially of the air-chamber externally of and around the oil-conducting passage-way, said flap-valves being arranged to be swung upwardly and outwardly by suction created within the mixing-chamber and project upwardly and inwardly in their full open position.

5. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber having an air-inlet; a mixing-chamber arranged to discharge into the said passage-way; an oil-conducting passage-way arranged centrally of the air-chamber and discharging into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, and flap-valves normally closing the discharging end of the air-chamber around and externally of the last-mentioned passage-way and radially of the air-chamber and in position to be swung upwardly and outwardly, said flap-valves projecting upwardly and inwardly in their full open position.

6. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber arranged at an elevation below the cylinder and provided at one side with an air-inlet; a rim around the upper end of the air-chamber; a mixing-chamber located next above the air-chamber between the air-chamber and the aforesaid passage-way and enlarged at its lower end and arranged to discharge upwardly into the said passage-way; means for controlling the discharge of the combustible mixture from the mixing-chamber to the said passage-way; an oil-conducting passage-way arranged

centrally of the air-chamber and discharging upwardly into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, and several flap-valves normally resting on the aforesaid rim and closing the discharging end of the air-chamber and hinged or pivoted externally of the air-chamber, said flap-valves being arranged to swing upwardly and outwardly within the lower enlarged portion of the mixing-chamber by suction created within the mixing-chamber and having a limited upward movement.

7. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber provided with an air-inlet; a rim around the upper end of the air-chamber; a mixing-chamber located next above the air-chamber between the air-chamber and the aforesaid passage-way, said mixing-chamber being enlarged transversely at its lower end and arranged to discharge upwardly into the said passage-way; means for controlling the discharge of the combustible mixture from the mixing-chamber to the said passage-way; an oil-conducting passage-way arranged centrally of the air-chamber and discharging upwardly into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, and several flap-valves normally resting on the aforesaid rim and closing the discharging end of the air-chamber and hinged or pivoted externally of the air-chamber, said flap-valves being arranged to swing upwardly and outwardly within the lower enlarged portion of the mixing-chamber by suction created within the mixing-chamber and having a limited upward movement.

8. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber provided with an air-inlet; a mixing-chamber located next above the air-chamber between the air-chamber and the aforesaid passage-way, said mixing-chamber being enlarged transversely at its lower end and arranged to discharge upwardly into the said passage-way; means for controlling the discharge of the combustible mixture from the mixing-chamber to the said passage-way; an oil-conducting passage-way arranged centrally of the air-chamber and discharging upwardly into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, and several hinged or pivoted flap-valves normally closing the discharging end of the air-chamber and arranged to swing upwardly and outwardly within the lower enlarged portion of the mixing-chamber by suction created within the mixing-chamber and having a limited upward movement.

9. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine, of an air-chamber provided at one side with an air-inlet; a mixing-chamber located between the air-chamber and the aforesaid passage-way and arranged to discharge into the said passage-way; means for controlling the discharge of the combustible mixture from the mixing-chamber to the said passage-way; an oil-conducting passage-way discharging upwardly into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a valve for regulating the discharge of oil from the oil-conducting passage-way, and several hinged or pivoted flap-valves normally closing the discharging end of the air-chamber and arranged to swing from the air-chamber by suction created within the mixing-chamber and having a limited movement in opening.

10. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine; a mixing-chamber arranged to discharge into the aforesaid passage-way; an air-conducting passage-way discharging into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a needle-valve for regulating the discharge of oil from the oil-conducting passage-way and extending centrally through and longitudinally of the mixing-chamber, and means whereby a discharge of air into the mixing-chamber around the discharging end of the oil-conducting passage-way by suction created within the mixing-chamber is effected, of two slide-valves arranged to control opposite sides respectively of the aforesaid passage-way, one of the slide-valves being large enough in dimensions to render it capable in its closed position of projecting past or beyond the needle-valve in the direction of the other slide-valve and provided at its inner side edge and centrally with a recess *p* with a groove 23 formed in and centrally of the central wall of the recess, and the last-mentioned valve being provided, at and centrally of its inner side edge, with a tongue *l* with a groove 24 formed in and centrally of the tongue, all arranged and operating substantially as shown, for the purpose specified.

11. In a carbureter, the combination, with a passage-way for feeding a combustible aeriform mixture into the cylinder of an internal-combustion engine; a mixing-chamber arranged to discharge into the aforesaid passage-way; an air-conducting passage-way discharging into the mixing-chamber; means for supplying oil to the last-mentioned passage-way; a needle-valve for regulating the dis-

charge of oil from the oil-conducting passage-way and extending through and longitudinally of the mixing-chamber, and means whereby a discharge of air into the mixing-chamber around the discharging end of the oil-conducting passage-way by suction created within the mixing-chamber is effected, of two slide-valves arranged to control opposite sides respectively of the aforesaid passage-way, and one of the slide-valves being large enough in dimensions to render it capable in its closed position of projecting past or beyond the needle-valve toward the other slide-valve.

In testimony whereof I sign the foregoing specification in the presence of two witnesses.

WILLIAM A. HATCHER.

Witnesses:
C. H. DORER,
B. C. BROWN.