

W. G. NAGEL.
CARBURETER.

APPLICATION FILED MAY 22, 1911.

1,016,169.

Patented Jan. 30, 1912.

Fig. 1.

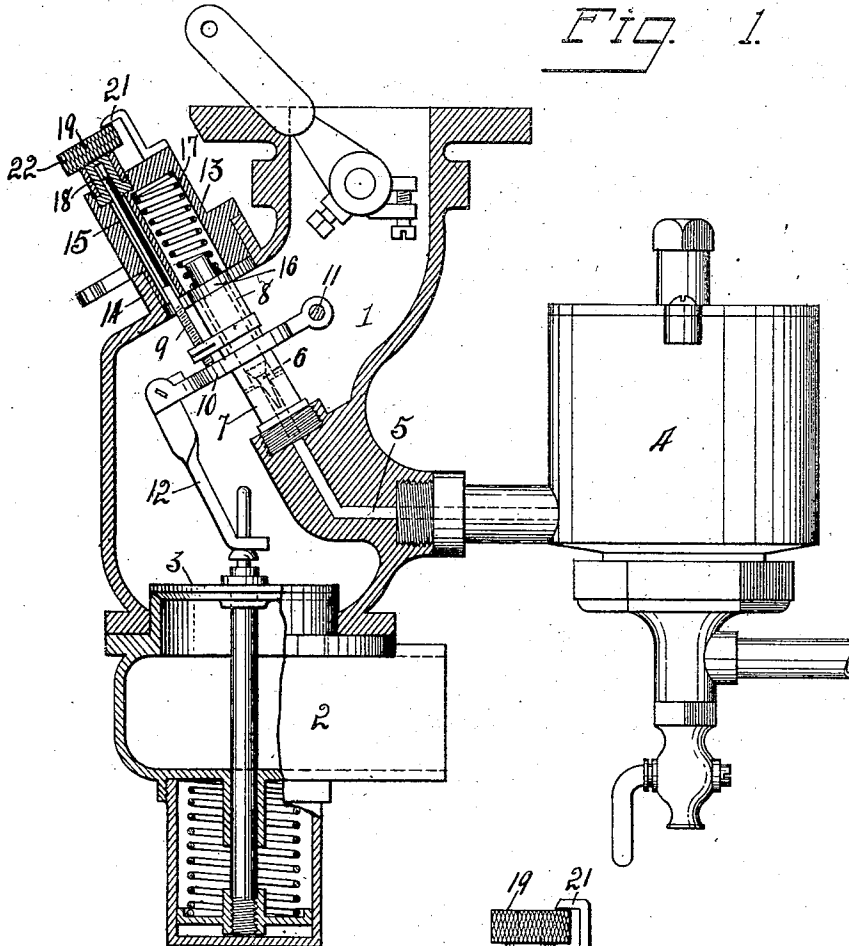


Fig. 3.

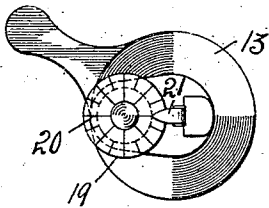
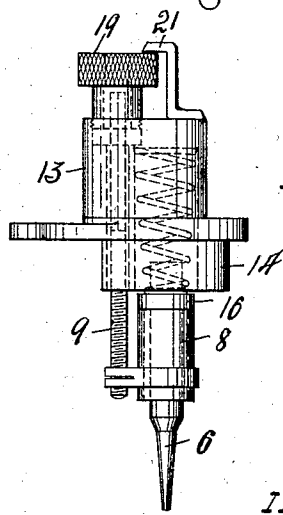


Fig. 2.



WITNESSES:

C. H. Hills,
M. Oppenheim

INVENTOR:

William G. Nagel,
By Owen & Owen,
His attys.

UNITED STATES PATENT OFFICE.

WILLIAM G. NAGEL, OF TOLEDO, OHIO, ASSIGNOR OF ONE-THIRD TO ISAAC KINSEY
AND ONE-THIRD TO FRANK COLLINS, BOTH OF TOLEDO, OHIO.

CARBURETER.

1,016,169.

Specification of Letters Patent.

Patented Jan. 30, 1912.

Application filed May 22, 1911. Serial No. 628,696.

To all whom it may concern:

Be it known that I, WILLIAM G. NAGEL, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Carbureters; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to carbureters and more particularly to the adjustment of the needle valve which controls the flow of the liquid fuel to the mixing chamber, and the object thereof is to provide means whereby the movable needle-valve of a carbureter may be quickly and easily adjusted from outside the carbureter while the engine is in operation.

While my invention is especially adapted for use in connection with the type of carbureter shown in United States Letters Patent No. 988,502, of April 4, 1911, it is also intended for use in connection with any of the numerous makes of carbureters to which it may be applied.

It has long been common in the art to provide means external of the carbureter for adjusting the position of a fixed or stationary needle-valve with relation to its seat, and it is also old to provide external means for adjusting the relative movements of the air and liquid fuel valves, but so far as I am aware I am the first to devise means external of the carbureter for adjusting the initial setting of a needle-valve having a longitudinal movement independent of such movement of adjustment.

In carbureters in which the movements of a liquid fuel valve of the needle type toward and from its seat are automatically controlled by the movements of an air-valve it has been found in practice to be extremely difficult to secure an accurate initial adjustment or setting of the needle-valve, for the reason that such adjustment can only be made by stopping the engine, removing the valve and its associated parts from the carbureter, changing the adjustment, replacing the valve and associated parts, and again starting the engine. This operation has to

be repeated until the proper adjustment is secured. It also frequently happens that in removing and replacing these parts other adjustments are unintentionally changed, thus causing still further annoyance. By the use of my invention the initial adjustment or setting of the needle-valve can be quickly and easily made from the outside of the carbureter while the engine is running and without danger of interfering with other adjustments, and after such initial setting is accomplished other adjustments, such as the adjustment of the relative movements of the needle-valve to the movements of the air-valve, may be made without changing or interfering with such initial adjustment, thus saving an immense amount of time and annoyance and resulting in a more perfect adjustment of the carbureter.

It is a well known fact that the richness of the mixture required to secure the best results from a hydrocarbon engine varies with the temperature of the atmosphere and that a perfect adjustment of a carbureter for summer months will not give satisfactory results in the winter months and vice versa. This is especially true upon the starting of the engine after it has become cold and while the engine is running at slow speed, say from one to ten miles an hour, a much richer mixture being required in cold weather than in warm weather. As comparatively few automobile owners are capable of adjusting their own carbureters, this means that at least twice a year an expert must be sought for the purpose of readjusting the carbureter to meet changed conditions of temperature. By the use of my invention the adjustment of the needle-valve is made so simple that any person may make it, the only requirement being the slight turning of an adjusting part located at a convenient point on the exterior of the carbureter.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a side view of the carbureter partly in elevation and partly in vertical section, illustrating the application of my invention. Fig. 2 is an enlarged detail of the needle-valve and associated parts, and Fig. 3 is a top plan view thereof.

Referring to the drawings, 1 designates the carbureting chamber of a carbureter, one end of which is provided with an air-supply inlet 2, which is normally closed by a valve 3 that is opened by engine suction, while the other end thereof is provided with an outlet passage as is usual in carbureters of this type.

4 designates a float chamber for the liquid fuel, and this chamber has communication through a passage 5 with the interior of the carbureting chamber. A needle-valve 6 controls the quantity of feed of the liquid fuel to the carbureting chamber from the liquid-fuel nozzle 7.

A sleeve 8 surrounds and supports the needle-valve and carries a bearing screw or pin 9, which is threaded through or otherwise secured in a lug projecting laterally from said sleeve. Said screw or pin is adapted to bear at its lower end upon an annular surface provided on the upper side of a lever or actuating member 10, which is fulcrumed within the carbureting chamber at one side of the nozzle, as at 11, and has its opposite or free end connected by a link 12 to the air-valve 3, whereby an opening movement of the air-valve will raise said lever and impart an opening movement to the needle 6 through the medium of the screw 9 and member 8.

A hollow plug 13 is revolubly seated within an annular flange 14, extending from the side of the carbureter casing, and this plug 13 is provided with a bore 15 extending longitudinally through a side portion thereof into which the outer end of a screw 9 projects, so that a turning of the plug 13 in its seat moves the point of contact between the screw 9 and lever 10 with reference to the fulcrum of said lever.

The connections above described provide means for externally adjusting the movement of the gasoline-valve with reference to the opening movement of the air-valve, as fully described in said Patent No. 988,502.

My invention relates to the means for adjusting the initial setting or minimum opening of the needle-valve for regulating the feed of gasoline during the starting or slow running of an engine, during which time the air-valve is but slightly raised off its seat. By the term "initial setting or minimum opening of the needle-valve" I refer to the position of said valve with reference to its seat at such times as the air-valve is closed. In practice I have found that in the summer months the initial setting of the valve should be substantially on its seat, while in the winter months it is desirable to have the initial setting of the valve at a point some distance from its seat in order to afford a liberal feed of gasoline even though the air-valve is but slightly opened. I accomplish this slow speed ad-

justment of the needle-valve in the following manner: An annular shoulder 16 is formed on the upper end portion of the valve-stem and rests on top of the sleeve 8, being yieldingly held thereto by means of a coiled spring 17, which bears against said shoulder and the closed end of the hollow plug 13, thus causing longitudinal movements of the sleeve 8 to be communicated to the needle-valve. The upper end of the screw 9, which extends through the bore 15, is squared or of other suitable irregular shape in cross-section, and is adapted to have free longitudinal movements through a correspondingly-shaped socket in a part 18, which is fixed in any suitable manner to the adjusting-head 19, which latter is mounted for rotatable movements on top of the plug 13 and in line with the bore 15 therein. The part 18 is shown in the present instance as coöperating with the outer end portion of the plug 13 to retain the adjusting-head 19 seated for free rotary movements thereon. The top of the adjusting-head 19 is provided with a dial 20, with which a finger 21, secured to the plug 13, coöperates to afford a scale of adjustments. The periphery of the adjusting-head is roughened as at 22 to provide a gripping surface for the fingers. It will be apparent from the above description that a turning of the adjusting-head 19 causes a turning of the screw 9 and a consequent raising or lowering of the needle-valve with reference to its seat.

I wish it understood that my invention is not limited to use in connection with any particular type of carbureter or to any specific construction or arrangement of parts, except in so far as such limitations are specified in the claims.

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

1. In a carbureter, a liquid fuel valve, a suction valve, a lever movable by opening movements of the suction valve to impart opening movements to the liquid fuel valve, adjustable means associated with the liquid fuel valve and coacting with the lever to communicate movements from the latter to the former, said means being adjustable both to regulate the minimum opening of the liquid fuel valve and the opening movements thereof, and means without the carbureter operable to adjust said adjustable means to regulate the minimum opening of the liquid fuel valve but permitting free reciprocal movements of the adjustable means with the liquid fuel valve.

2. In a carbureter, a reciprocally movable liquid fuel valve, an air-valve, a member movable by movements of the air-valve, an adjustable connection intermediate the liquid fuel valve and member, means for

adjusting said connection to regulate the opening movements of the liquid fuel valve, and means external of the carbureter permitting free reciprocal movements of said liquid fuel valve and connection and operable to regulate the minimum opening of the valve.

3. In a carbureter, a reciprocally movable liquid fuel valve, an air valve, a member movable by movements of the air valve, means for causing opening movements to be communicated to the liquid fuel valve from movements of said member, said means having a reciprocally movable part which threads into another part thereof and is of irregular form in cross-section for a portion of its length, and an external rotatable adjusting head which permits said reciprocally movable part to have free reciprocal movements relative thereto and is operable to turn such part within the part into which it is threaded, the relative adjusting of said parts effecting an adjustment of the liquid fuel valve relative to the lever.

4. In a carbureter, an air valve, a valve for liquid fuel, means connecting said valves for imparting opening movements from one to the other, said connecting means having parts which are relatively adjustable to regulate the minimum opening movements of the liquid fuel valve, one of said parts having a stem projecting therefrom which is of irregular form in cross-section, and a member external to the carbureter having a socket complementary to said stem within which the latter projects for free reciprocal movements, said member being adapted when rotated to effect a relative adjustment of the parts of said connecting means.

5. In a carbureter, an air valve, a liquid fuel valve, a lever disposed transversely of the fuel valve and movable by the air valve, a member carrying the fuel valve, a part threaded to said member and having contact with the lever, means for revolvably adjusting said part relative to the lever to change its point of contact therewith, and rotatable means which permits said part to have free reciprocal movements and is operable from without the carbureter to turn said part within said member to regulate the minimum opening of the fuel valve.

6. In a carbureter, an air valve, a liquid fuel valve, a lever movable by the air valve, a revoluble member carrying the fuel valve, a part threaded through said member and forming an adjustable connection between the member and lever, a cap rotatably carried by the carbureter and having a socket at one side of its axis into which said part reciprocally projects, said cap being adapted when rotated to revolve said member and part to change the point of contact of the latter with the lever to regulate the maximum opening movements of the fuel valve, and means without the carbureter which permits said part to have free reciprocal movements and is operable to rotate said part to adjust it relative to said member to regulate the minimum opening of the valve.

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

WILLIAM G. NAGEL.

Witnesses:

WILBER A. OWEN,
E. E. THOMAS.