No. 848,425. PATENTED MAR. 26, 1907.

L. ANDERSON.

CARBURETER FOR GASOLENE ENGINES

APPLICATION FILED AUG. 13, 1906.

2 SHEETS—SHEET 1.

Fig. 1

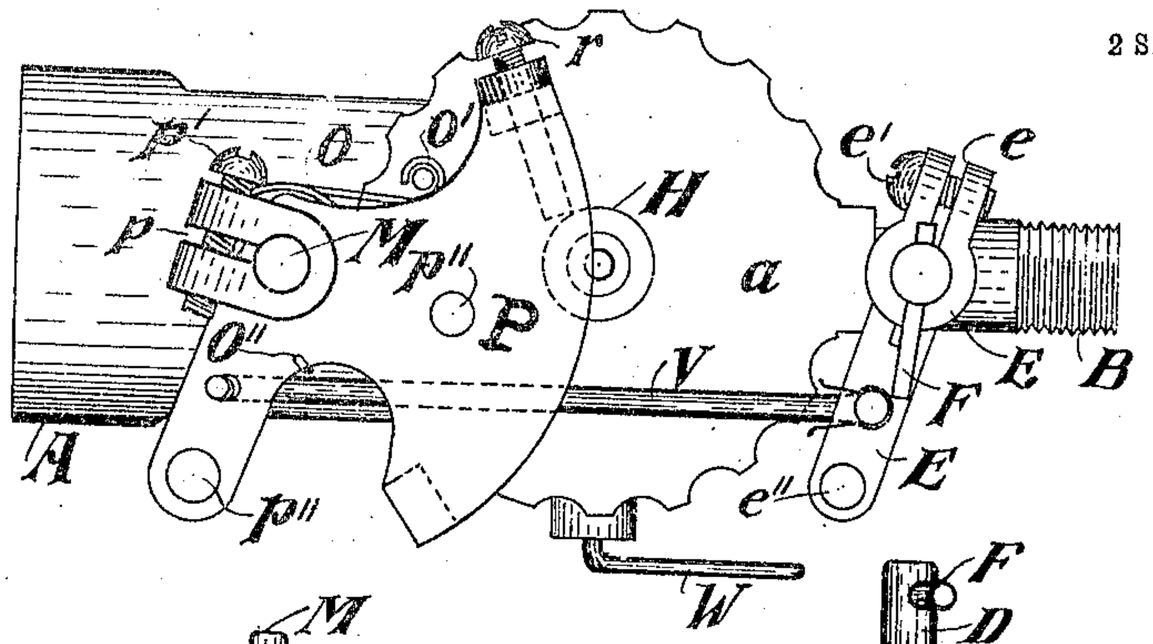

Fig. 2

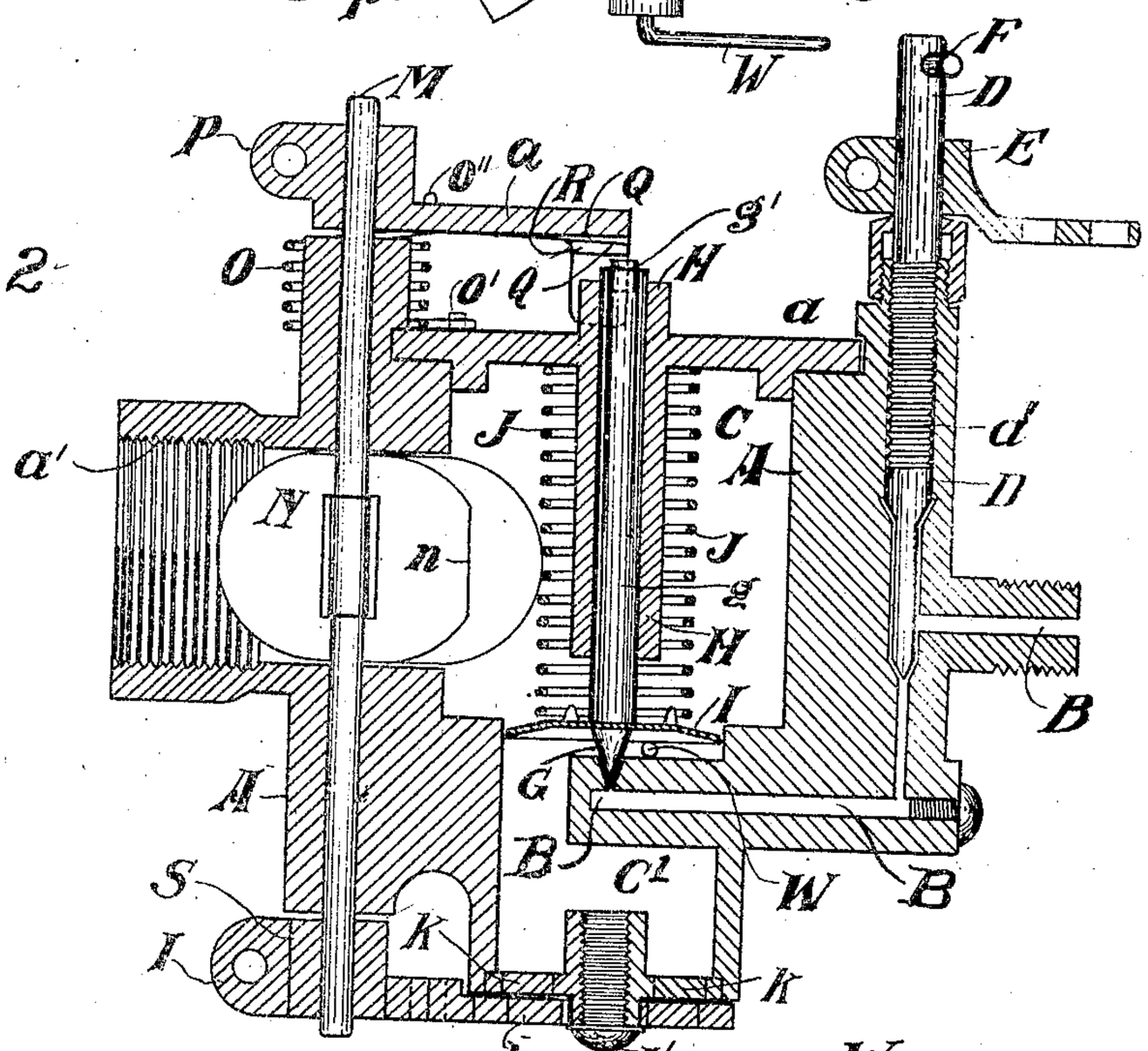

Fig. 3

Witnesses.

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2 SHEETS—SHEET 2.

Fig. 5.

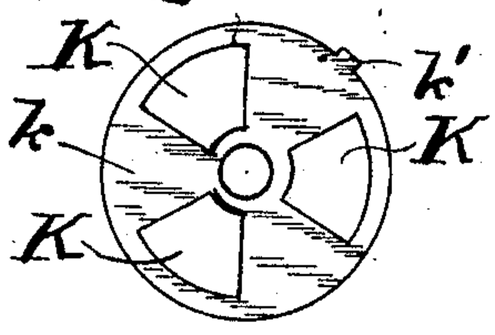


Fig. 4.

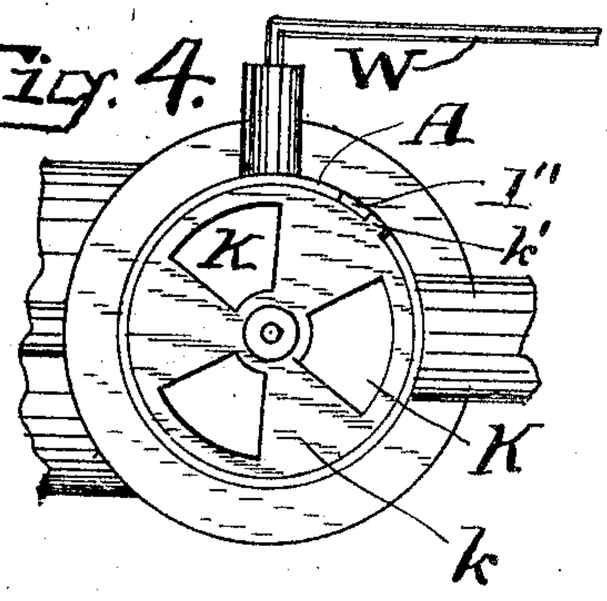


Fig. 6.

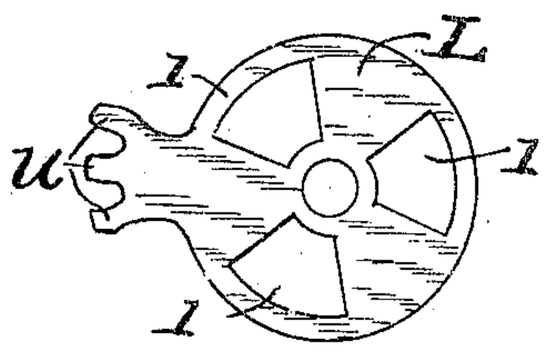


Fig. 7.

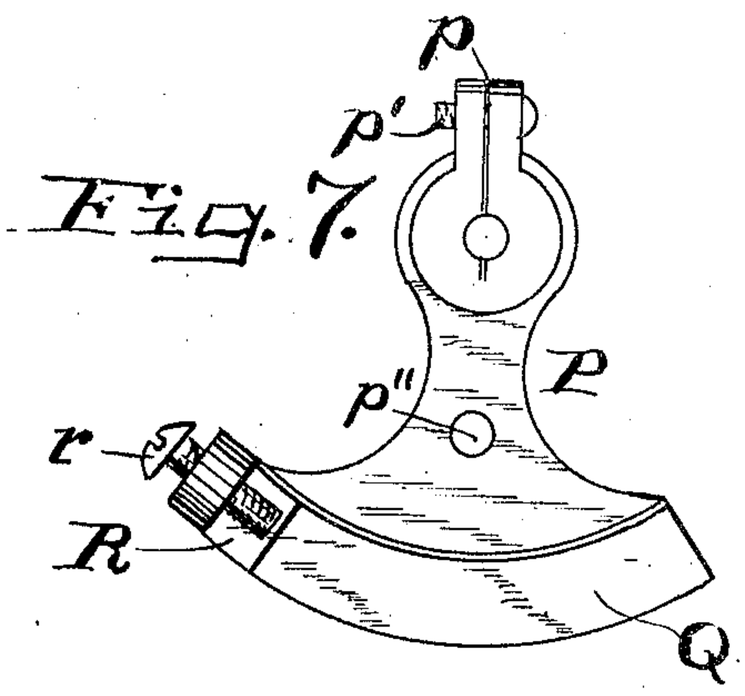
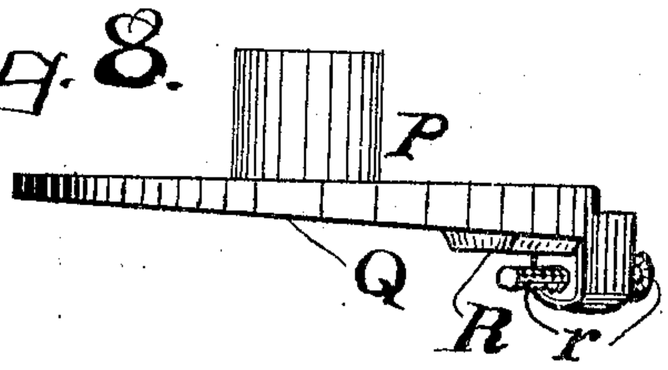


Fig. 8.



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UNITED STATES PATENT OFFICE

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CARBURETER FOR GASOLENE-ENGINES.

No. 848,425. Specification of Letters Patent. Patented March 26, 1907.

Application filed August 13, 1906. Serial No. 330,426.

To all whom it may concern:

Be it known that I, LAURITZ ANDERSON, a citizen of the United States, and a resident of Quincy, in the county of Adams and State of Illinois, have invented certain new and useful Improvements in Carbureters for Gasolene-Engines, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a full and complete description, sufficient to enable those skilled in the art to which it pertains to understand, make, and use the same.

This invention relates to carbureters of the valve type, in contradistinction to those provided with a float.

The object of this invention is to obtain a carbureter by means of which the relative and actual quantity or volume of air and gasolene vapor supplied to the engine or motor to which it is attached may be mechanically controlled to produce an explosive compound wherein the combustion will be practically complete, whether such engine or motor be run at high or low speed and under a light or heavy load.

A further object of the invention is to obtain a carbureter of the character named which when used on a marine engine will obtain immediate stopping of the same when such carbureter is closed.

In the drawings referred to as illustrating a construction embodying this invention, Figure 1 is a top view of the carbureter. Fig. 2 is a vertical sectional view of the carbureter, and Fig. 3 is a bottom view of the carbureter. Fig. 4 is a bottom view of the vertical cylinder of casing A of the carbureter with the movable disk thereof removed therefrom to show the stationary perforated air-disk of the apparatus. Fig. 5 is a view of the stationary air-disk of the apparatus. Fig. 6 is a view of the movable air-disk of the apparatus. Fig. 7 is a bottom plan view of a movable lever and of the inclined table thereon; and Fig. 8 is a rear elevation of the movable lever and inclined table on the under side thereof, forming a part of the apparatus.

A reference-letter applied to designate a given part is used to indicate such part throughout the several figures of the drawings wherever the same appears.

In Fig. 3 broken lines indicate the several parts opened to their fullest extent, and the full lines illustrate such part in a closed position.

A is the shell or casing of the carbureter, and *a* is the removable top of the casing. Casing A is provided with screw-threads at the discharge end of the air-discharge passage from the carbureter, by means of which the casing is attached to the pipe communicating with the inlet port or ports of a gasolene-engine.

B is the gasolene-inlet of the carbureter.

C is the main chamber in casing A, and C′ is an auxiliary chamber forming a passage-way from the air-inlet of the carbureter to the chamber C and is hereinafter referred to as the "air passage-way."

D is a needle-valve coacting with its valve-seat to control the admission of gasolene to inlet B. Needle-valve D is provided with screw-threads on the stem *d* thereof and with the handle E, which is attached to the upper end of stem *d*. Handle E is preferably provided with a split *e* in the hub thereof and with tightening-screw *e′*, by means of which such handle may be secured in a determined position on stem *d*. Handle E is also provided with aperture *e″*.

F is a handle to stem *d*, by means of which such stem may be turned independently of the turning of the handle E. Handle F is provided for the purpose of adjusting the position of the valve D relative to its seat to correspond with the requirements of the engine to which the carbureter is attached, such requirement being controlled, so far as this carbureter is concerned, by the bore of the cylinder or cylinders of the engine to which the apparatus is attached.

G is a needle-valve arranged to coact with a valve-seat which is located on the inner end of the gasolene-inlet B. Needle-valve G controls the discharge of gasolene from inlet B to air passage-way C′.

g is the stem of valve G.

H is a boss on removable top *a*, such boss being provided with a hole therethrough, through which the stem *g* of valve G extends and in which it is longitudinally movable. The operation of the carbureter is not affected by the removable feature of the top *a*, such top being made removable merely to provide means to obtain access to the interior of the casing when desired.

I is a disk rigidly secured on stem *g* in such

location as to be positioned in air passage-way C′ and substantially close such air passage-way when valve G is seated.

J is a spring yieldingly holding valve G on its seat.

K K K are apertures in disk *k*, and *l l* are apertures in disk L. Disk L is mounted on the bolt or screw *l′* to turn thereon, and mechanisms are provided, which are hereinafter explained, to turn such disk L to vary the size of the air-inlet which is obtained by the apertures K K K and *l l l*.

I have shown and described the air-inlets to air passage-way C′ as consisting of disks *k* and L, provided with apertures K K K and *l l l* therethrough, such disks coacting as one thereof (L) is turned on its pivot *l′*, thereby varying the opening of the air-inlet.

The air-inlet must be partially opened whenever the engine to which the carbureter is attached is in motion, and the larger the bore of the cylinders thereof the greater will be the area of the air-inlet when the engine is running at its lowest possible speed, and to provide for the variation I construct the disk *k* so as to fit closely into the casing A at the lower end of the air passage-way C′ and provide the projection *k′* on disk *k* and recess *l″* in casing A, so that a chisel or other suitable tool may be applied to the projection *k′* to force the disk *k* around to a "set" position. When the disk *k* is thus adjusted for a given engine, its position remains unchanged, and at such time when the disk L is turned to the position most nearly closing the air-inlet the engine will run at its lowest rate of speed.

M is a rod mounted in the shell or casing A, so that a rotating movement may be given thereto. Rod M extends through the discharge passage-way *a′* from chamber C, and N is a throttling valve or fly secured on rod M to turn therewith, and thereby to vary the area of such passage-way. A portion of the fly or valve N is cut away, as at *n*, Fig. 2, so that when the rod M is turned to throttle the engine or carbureter to the fullest extent some air or some of the mixture of air and gasolene vapor may flow through the carbureter and into the engine.

O is a spring one end whereof is attached to top *a*, as at O′, and the other end whereof is attached to arm or lever P, as at O″. The arm or lever P is rigidly secured on rod M, so that the turning of such lever will turn the rod. The manner of securing this lever P to the rod M, which I prefer to employ, is by producing the cut *p* in the hub of such lever and placing the tightening-screw *p′* through such hub.

The lever P is provided with a table Q on the under side thereof. Table Q is not in a horizontal plane—that is, it is not in a plane at right angles to the axis of the vertical rod M—and hence when the disk I on stem *g* is raised by the flow of air through the air-passage C′ into chamber C, thereby raising the stem *g*, the extent of the raising of such stem is determined by the position of lever P as the upper end of the stem *g* (or plug *g′* in such stem) is brought into contact with such table Q.

The play of the disk I being controlled by the rotation of the vertical rod M as such rod is turned by means of mechanism hereinafter described, it follows that both the quantity of gasolene discharged from passage-way B by the unseating of the valve G and the volume of air flowing through the passage-way C′ are correspondingly varied, so that the proportion of each thereof may remain constant, or nearly so, as the valve or fly N is turned by rod M to throttle the engine to which the carbureter is attached.

R is a stop on the under side of the lever P at the end of the table Q. *r* is a set-screw which may be so arranged or set that the stop R is over the upper end of the stem *g* of valve G when the valve N is in position nearly closing the discharge-passage of the carbureter, and such set-screw *r* is so set when the apparatus is to be used on a marine engine. The stop R is so close to the upper end of stem *g* or to the plug *g′* in such stem when such stop is adjusted to be over the stem that upward movement thereof to any appreciable extent cannot occur and the valve G cannot be unseated. By this arrangement sudden stopping of the engine is obtained.

When the apparatus is put on an automobile-engine, the set-screw *r* is set so that when the discharge passage-way *a′* is most nearly closed by valve N the stop R is not over the upper end of stem *g*, and hence sufficient vertical movement is permitted in such stem to allow the valve G to unseat, so that enough gasolene will be discharged from inlet B to cause the engine to be kept "alive," as it is termed.

T is a lever rigidly secured to the vertical rod M, as by split *t′* and tightening-screw *t″* in hub *t*, and U U are teeth at one end of the lever T, arranged to intermesh with teeth *u* on disk L. The turning of rod M is thus made to turn the disk L.

V is a connection between levers E and P.

W is a wire coming under the disk I at the inner end of such wire, by means of which the valve G may be raised off its seat when lever P is turned to open the carbureter for the flow therethrough of air and gasolene vapor. Wire W may be used to quickly obtain a supply of gasolene in the air passage-way C′ when desired to start the engine.

Mechanism to actuate the apparatus may be attached to lever E, as by hooking it into aperture *e″*, or to lever P by hooking it into either one of the apertures *p″*.

The operation of this carbureter is as follows: The needle-valve D is assumed to have

been set at the proper place for the engine to which the carbureter is attached by turning the stem *d* by means of handle F and to have been secured after such adjustment firmly to lever E by means of the tightening-screw *e'*. The disk *k* is also assumed to have been set at the proper place in the casing A so that when the disk L is turned to close the air-inlet formed by apertures K and *l* to the smallest possible point of closing the proper volume of air will flow through the air passage-way C' into the chamber C. As hereinbefore stated, this setting of the needle-valve D and disk *k* is varied for different engines with reference to the size of bore of the cylinders, and when once this setting or adjusting is accomplished for a given engine it remains unchanged.

The adjustment of the gasolene-inlet valve D and of the air-inlet having been made, the throttle of the carbureter may be opened to its widest extent by turning the vertical rod M so that the fly or valve N lies in a vertical plane which extends through the longitudinal axis of the discharge-passage of the carbureter. By turning the vertical rod M the handle E, which is attached to lever P by connection V, and the disk L, which is connected to such vertical rod M by means of the lever T and intermeshing teeth U and *u*, are also turned, so that valve D and the air-inlets through disks *k* and L are opened to their widest extent, and at the same time the table Q on lever P is turned to permit the widest possible unseating of needle-valve G, (the greatest possible longitudinal movement to stem *g*.)

The four last above-described operations having been performed—to wit, valve N opened to its widest extent, valve D opened to its widest extent, the air-inlets formed by the passage-ways through disk *k* and disk L being opened to their widest extent, and the table Q moved so that the stem *g* of valve G may open to its widest extent—the crank-shaft of the engine to which the carbureter is attached may be turned to "crank" the engine in the usual way. The movement of the piston of the engine will produce a difference in pressure on the inlet and discharge ends of the carbureter, and thereby cause a flow of air through the air-inlets and through the auxiliary chamber or passage-way C' into the chamber C, and such flow of air will raise the disk I against the resilience of spring J, and thereby unseat valve G and induce a flow or permit a flow of gasolene from the inlet B into the auxiliary chamber or passage C', and a mixture of air and gasolene vapor will be thus obtained in chamber C, and such mixture will flow therefrom into the cylinders of the engine, to be there compressed, exploded, and exhausted in the usual way.

It will be seen that by the turning of the vertical rod M a corresponding turning of the several movable parts of the apparatus is simultaneously obtained, as such parts are tied together in the manner hereinbefore described, and that thereby after the engine is started the movement of the rod M will cause a corresponding and measured movement of such movable parts and that thereby the relative quantity of gasolene and volume of air are directly and properly controlled—that is, the quantity of gasolene is increased when the volume of air is increased, and the quantity of gasolene is decreased when the volume of air is decreased—so that the explosive mixture delivered to the engine from or by this carbureter is at all times a mixture of which practically perfect combustion is obtained. Great economy in the use of gasolene, with no smoke and no carbon deposit, are obtained thereby, and by reason of the great adjustability of the several parts and the mechanical movement thereof by the operator in control of the engine a given size of carbureter may be applied to engines of widely different bore to the cylinders.

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

1. In a carbureter, a casing provided with a chamber therein and with an air passage-way and provided with an air-inlet communicating with the chamber through such air passage-way, and provided with a gasolene-inlet the discharge end whereof communicates with the air passage-way, and a movable member to the air-inlet, and provided with a discharge-passage from the chamber, in combination with a movable valve coacting with a valve-seat to control the admission of gasolene to the gasolene-inlet, means to adjust the valve relative to its seat and means to move such adjusted valve from and back to its adjusted position, a valve coacting with a valve-seat to control the discharge end of the gasolene-inlet, means to limit the movement of the valve at the discharge end of the gasolene-inlet, a disk secured to the stem of such valve, such disk positioned in the air passage-way to substantially close the same when the valve is seated and to unseat such valve when moved by the flow of air through such air passage-way into the chamber, means to throttle the discharge passage-way from the chamber in the casing and means to vary the area of the air-inlet, and connections between the valve controlling the admission of gasolene to the gasolene-inlet, the means to limit the movement of the valve controlling the discharge of gasolene from the gasolene-inlet, the means to throttle the discharge passage-way and the movable member of the air-inlet so that movement of one thereof will produce corresponding movement of the remaining ones thereof; substantially as described.

2. In a carbureter, a casing provided with

a chamber therein and with an air passage-way to the chamber and a discharge passage-way from such chamber, and provided with an air-inlet communicating with the air passage-way to the chamber, and provided with a gasolene-inlet the discharge end whereof communicates with the air passage-way to the chamber, and a movable member to the air-inlet, in combination with a movable valve coacting with a valve-seat to control the admission of gasolene to the gasolene-inlet, means to adjust the valve relative to its seat and means to move such adjusted valve from and back to its adjusted position, a valve coacting with a valve-seat to control the discharge end of the gasolene-inlet, adjustable means to limit the movement of the valve at the discharge end of the gasolene-inlet, a disk secured to the stem of such valve, such disk positioned in the air passage-way to the chamber to substantially close the same when the valve is seated and to unseat such valve when moved by the flow of air through such air passage-way into the chamber, means to throttle the discharge passage-way from the chamber in the casing and means to move the movable member of the air-inlet, and connection between the means to move the valve controlling the admission of gasolene to the gasolene-inlet from and back to its adjusted position, the means to limit the movement of the valve controlling the discharge of gasolene from the gasolene-inlet, the means to throttle the discharge passage-way and the movable member of the air-inlet so that movement of one thereof will produce corresponding movement of the remaining ones thereof; substantially as described.

3. In a carbureter, a casing provided with a chamber therein, and with an air passage-way to the chamber and a passage-way from the chamber, and provided with an air-inlet communicating with the chamber through such air passage-way, a movable member to the air-inlet and provided with a gasolene-inlet the discharge end whereof communicates with the air passage-way, in combination with a movable valve coacting with a valve-seat to control the admission of gasolene to the gasolene-inlet, means to adjust the valve relative to its seat and means to move such adjusted valve from and back to its adjusted position, a valve coacting with a valve-seat to control the discharge of gasolene from the discharge end of the gasolene-inlet, a disk secured to the stem of such valve, such disk positioned in the air passage-way to substantially close the same when the valve is seated and to unseat such valve when moved by the flow of air through such air passage-way into the chamber, means to restrict the air-discharge passage-way from the chamber and connections between the mechanism by means of which the valve which controls the admission of gasolene to the gasolene-inlet is moved from and back to its adjusted position, the valve restricting the air-discharge passage-way and the movable member of the air-inlet so that movement of one thereof will produce corresponding movement of the remainder thereof; substantially as described.

4. In a carbureter, a casing provided with a chamber therein and with an air passage-way to the chamber and a discharge passage-way from such chamber, and provided with an inlet communicating with the air passage-way to the chamber, and provided with a gasolene-inlet the discharge end whereof communicates with the air passage-way to the chamber, a movable member to the air-inlet, a movable valve coacting with a valve-seat to control the admission of gasolene to the gasolene-inlet, and means to adjust the valve relative to its seat and means to move such adjusted valve from and back to its adjusted position, in combination with a valve coacting with a valve-seat to control the discharge end of the gasolene-inlet, a movable rod, a lever on the rod, a table on the under side of the lever, such table in a plane at an angle to a plane at right angles to the axis of the rod, to limit the movement of the valve at the discharge end of the gasolene-inlet, a disk secured to the stem of such valve, such disk positioned in the air passage-way to the chamber to substantially close the same when the valve is seated and to unseat such valve when moved by the flow of air through such air passage-way into the chamber, a valve on the vertical rod to throttle the discharge passage-way from the chamber in the casing, a connection between the vertical rod and the movable member of the air-inlet, and a connection between the means to move the valve controlling the admission of gasolene to the gasolene-inlet from and back to its adjusted position and the movable rod so that movement of one thereof will produce corresponding movement to the remainder substantially as described.

LAURITZ ANDERSON.

In presence of—
CORA A. ADAMS,
CHARLES TURNER BROWN.