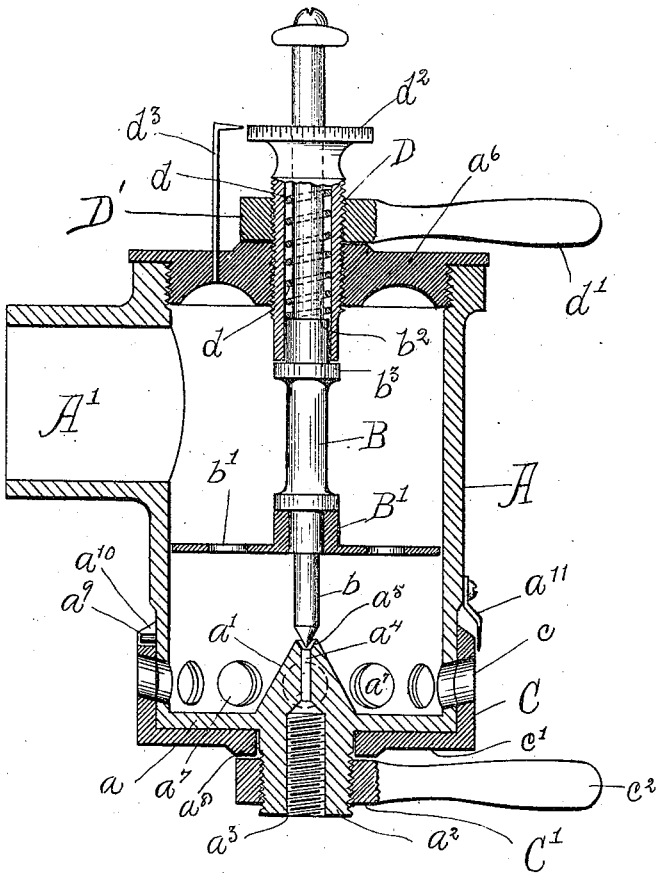
No. 649,191. Patented May 8, 1900.

G. ALDERSON.

CARBURETING AND GAS MIXING APPARATUS.

(Application filed Oct. 7, 1899.)

(No Model.)



Witnesses:

S. S. Noble

J. G. Meinbaum

Inventor,

George Alderson,

By Carter & Graves

Att'ys.

UNITED STATES PATENT OFFICE.

GEORGE ALDERSON, OF PERU, ILLINOIS, ASSIGNOR TO CHARLES BRUNNER, OF SAME PLACE.

CARBURETING AND GAS-MIXING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 649,191, dated May 8, 1900.

Application filed October 7, 1899. Serial No. 732,848. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ALDERSON, of Peru, in the county of La Salle and State of Illinois, have invented certain new and useful Improvements in Carbureting and Gas-Mixing Apparatus, of which the following is a specification.

This invention relates to improvements in carbureting and gas-mixing apparatus, and refers more specifically to improvements upon an apparatus of the same character as that upon which Letters Patent were granted to me May 4, 1897, No. 581,930.

Among the objects of the invention are to provide a construction which will insure a more rapid and thorough vaporization of the oil or carbureting liquid, and consequently a better carburizing of the air, to provide means for more thoroughly mixing the components of the vapor, to provide means for varying and controlling the amount of air introduced or the proportions of air and gas admitted upon each intaking impulse of the apparatus, and, in general, to simplify, cheapen, and improve the construction of the apparatus.

To this end the invention consists in the matters hereinafter described, and more particularly pointed out in the appended claim, and will be readily understood from the following description, reference being had to the accompanying drawing, in which is represented a vertical axial sectional view, with certain parts shown in side elevation, of an apparatus containing my invention as embodied in a carbureter.

Referring to said drawing, A designates as a whole the main body of the device, shown in the present instance as conveniently made cylindric and provided in its upper part with an outlet-nipple A', adapted to be connected with any suitable exhaust mechanism which will serve to draw vapor through the apparatus by impulses—as, for example, the cylinder of a gas-engine. In the construction shown the lower end of the body A is closed by means of an integral lower end wall a, substantially flat upon its inner surface and provided at its center with an upstanding boss a'. The said end wall is also provided externally with an axially-arranged inlet-nipple a^2, internally threaded, as indicated at a^3, for connection with any suitable source of oil-supply under pressure, the inlet-passage of said nipple being reduced and extended through the boss a', so as to open at the apex of the latter, as indicated at a^4. At its point of emergence through the boss the channel a^4 is countersunk or enlarged, as indicated at a^5, to form a valve-seat, against which rests the point of a needle-valve b. The needle-valve b is formed upon the lower end of a valve-stem B, which extends vertically upward through the interior of the carbureter and out through a central opening formed through the top wall a^6 of said body, being arranged to extend through suitable guiding and controlling mechanism to be hereinafter described and whereby the opening of the needle-valve is controlled.

a^7 designates a series of inlet-apertures formed through the side walls of the body at intervals apart, around the circumference of the latter and at a slight distance above the level of the inner surface of the lower wall, as indicated clearly in the drawing.

C designates a damper or valve-ring arranged to fit around the lower end of the body A and provided with a series of inlet-apertures c, adapted to be brought into register with the inlet-apertures a^7 of the carbureter-body. As a convenient construction said valve-ring is formed integrally with a disk c', arranged to underlie the lower end of the carbureter-body and centrally apertured to fit upon the base portion a^8 of the inlet-nipple. Obviously by rotating said valve-ring the inlet-apertures a^7 may be closed to any extent desired, and in order to lock said valve-ring in adjusted position the exterior of the nipple a^2 is screw-threaded to receive a locking-nut C', conveniently provided with a handle c^2, whereby it may be manipulated. Desirably means are provided for limiting the rotation of the valve-ring in either direction, such means being shown as conveniently comprising a stop or stud a^9, mounted in the side wall of the carbureter-body and arranged to project out through a circumferentially-extending slot or recess a^{10}, formed in the upper margin of the valve-ring. As

an additional convenience a portion of the upper margin of said valve-ring is graduated and an indicator a^{11} mounted upon the valve-body in position to coöperate with said graduated portion, thus enabling the operator to determine to a nicety the extent to which the inlets are opened or closed.

In the operation of the apparatus the oil admitted by the needle-valve flows down the inclined sides of the boss and distributes itself over the bottom of the carbureter, whence it is absorbed and taken up by jets of air drawn in through the inlet-apertures a^7, and in order to insure a more efficient action of the air-jets in thus taking up the oil the inlet-apertures through both valve-body and valve-ring are inclined downwardly and inwardly, so that the jets of air are caused to impinge upon the surface of the oil. To next describe the means whereby the air thus admitted is caused to operate the needle-valve and is at the same time thoroughly mixed, B′ designates a vane mounted rigidly upon the valve-stem B, so as to approximately partition the lower part of the chamber of the carbureter-body from the upper part thereof, but of such diameter as to move freely within said chamber. Within said vane are formed a plurality of passages b', spaced at intervals apart throughout the area of the vane and of such size as to permit the vapor to be drawn gradually through the vane, but at the same time with such resistance thereon as to lift the needle-valve against a resistance provided by a mechanism now to be described.

D designates an adjusting sleeve or stop threaded through the upper end wall of the carbureter-body, so as to telescope upon the valve-stem, the upper end portion of said sleeve being arranged to fit closely around the stem, while the remainder of the interior of the sleeve is enlarged sufficiently to accommodate a coiled resistance-spring d, surrounding the stem. That part of the valve-stem which extends within the lower end of said sleeve, below the spring, is enlarged to form an annular shoulder b^2, against which the spring acts to hold the valve against its seat. A second annular shoulder b^3 is formed upon the valve-stem immediately below the end of the sleeve, said shoulder being adapted to act as a stop to limit the upward movement of the valve-stem by engagement with the lower end of the sleeve. Inasmuch as the sleeve D is threaded through the end wall of the carbureter, it will be obvious that the throw of the needle-valve may be adjusted by simply screwing the said sleeve up or down, as required, and in order to lock said sleeve in adjusted position a lock-nut D′, provided with a handle d', is mounted upon the sleeve to jam against the end wall of the carbureter. As a desirable and convenient means of determining the adjustment of the throw of the needle-valve the upper end of the sleeve D is provided with an enlarged head d^2, the periphery of which is graduated, and an index or pointer d^3 is mounted upon the carbureter, so as to coöperate with said scale.

The operation of the device constructed as described is substantially similar to that of the apparatus heretofore patented to me and will therefore be entirely obvious from the foregoing description.

Among the advantages due to my present construction may be mentioned the following: In the construction set forth in my patent heretofore referred to the liquid to be vaporized was permitted to enter in substantially the same manner as in the present construction; but the air-inlets were arranged to pass through the bottom wall of the carbureter and to terminate in bosses rising sufficiently above the bottom of the chamber to prevent the escape of the oil therethrough. With this construction the air-jets were directed away from the surface of the liquid, whereas in the present construction, by reason of the location of the air-inlets above the bottom of the carbureting-chamber and their inclination downwardly toward said bottom, the air is caused to impinge against the oil and vaporize the same much more efficiently. The inclined sides of the central boss through which the oil is admitted are also directly in the path of the jets, which entering the inlet-apertures are deflected by the surface of the liquid, so as to sweep up along the inclined portions of the boss as the liquid runs down the same in a thin film, thereby further carbureting the incoming air. After leaving the lower part of the carbureting-chamber the air is drawn up through the valve-lifting vane, the numerous passages through the latter serving to thoroughly mix the vapor and cause it to pass out through the exhaust-passage a' in a very uniform and highly-carbureted state. By means of the damper or valve controlling the air-inlet apertures I am enabled to regulate the rate of flow through said apertures, so that the air is not permitted to pass over the oil too rapidly to become carbureted to the required degree, and by this means I am enabled to produce a vapor of the highest efficiency. It is to be noted also in this connection that the restricted openings through the vane also serve to retard the escape of the air from the lower part of the carbureter-chamber, and consequently insure a more thorough carburizing of the same.

I claim as my invention—

A gas-mixing apparatus comprising a receptacle substantially closed except at its top, where it is provided with an outlet, this receptacle being provided in the center of its bottom with a depending oil-inlet nipple threaded externally and its side wall above the bottom of the receptacle being provided with a series of air-inlets, a valve for these inlets consisting of a disk c' abutting against the bottom of the receptacle and provided with an upstanding flange at its edge closely

embracing the lower end of the receptacle and provided with a series of openings adapted to register with the air-inlets, and a clamp-nut on the depending inlet-nipple for holding the valve in its adjusted positions.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two subscribing witnesses, this 3d day of October, A. D. 1899.

GEORGE ALDERSON.

Witnesses:
ADOLPH HOSS,
PETER TROST.