Sept. 4, 1928. 1,682,761

T. LINGA

CARBURETOR

Filed Aug. 22, 1925 2 Sheets-Sheet 1

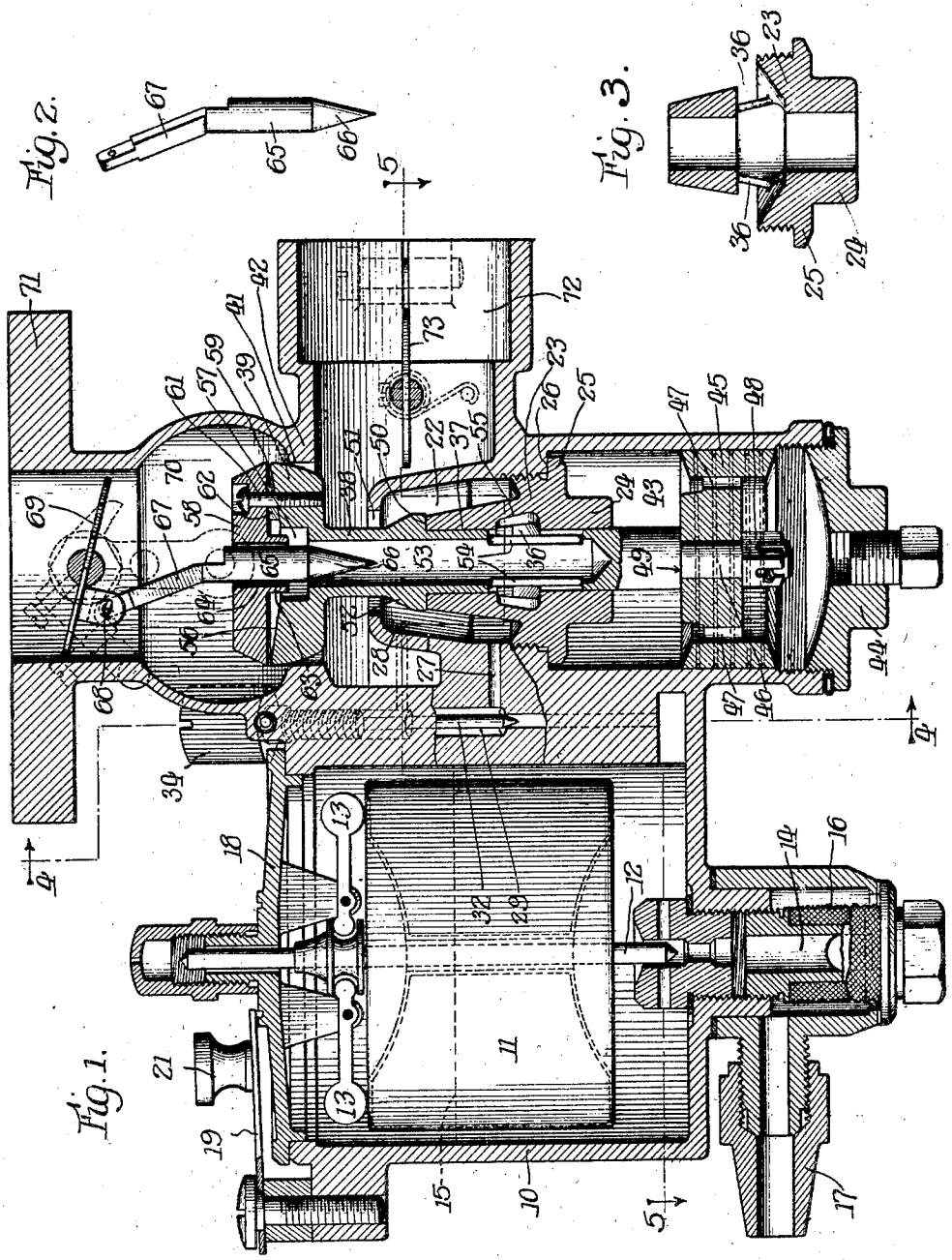

Fig. 1.

Fig. 2.

Fig. 3.

Witness:
A. J. Sawyer

Inventor:
Torbjorn Linga
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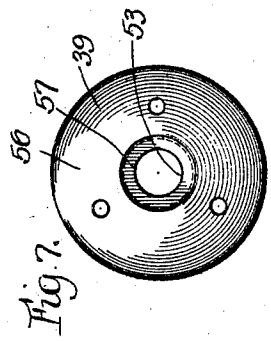

Fig. 7.

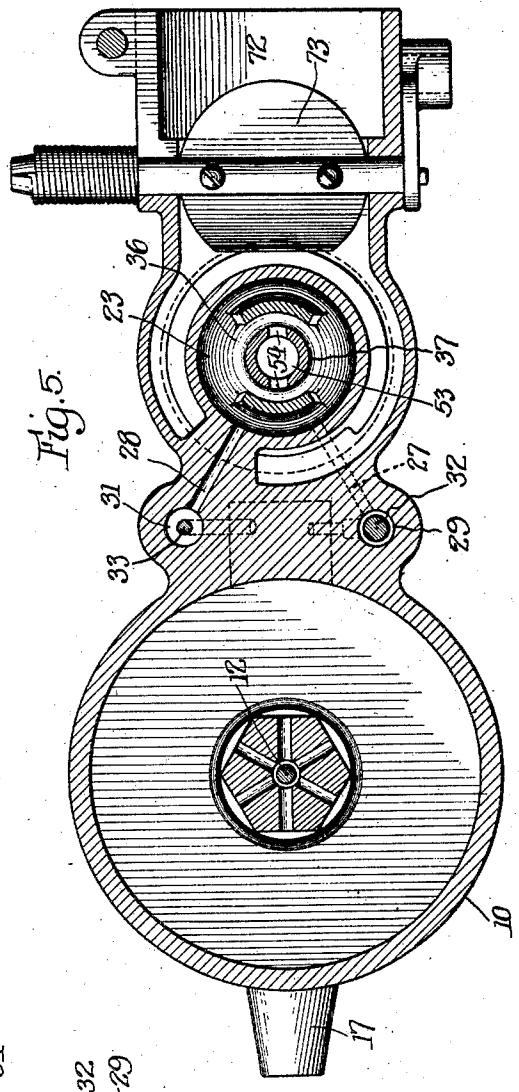

Fig. 5.

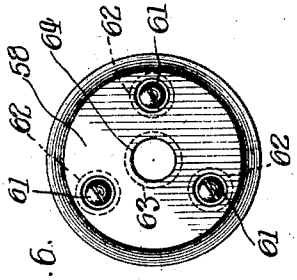

Fig. 6.

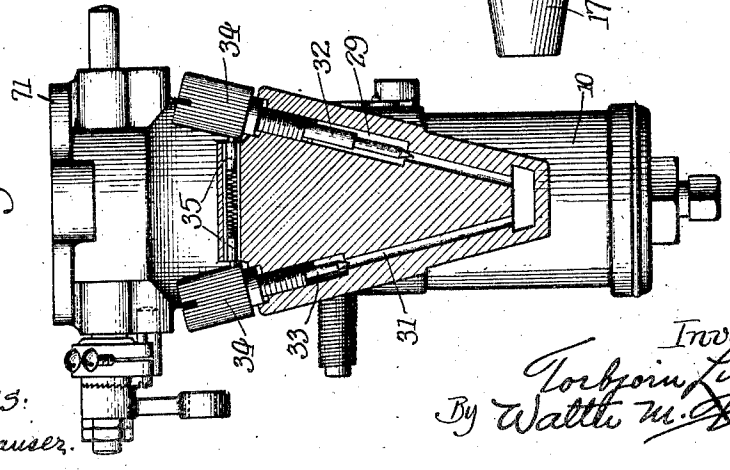

Fig. 4.

Witness:
A. J. Sauser.

Inventor:
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Patented Sept. 4, 1928. 1,682,761

UNITED STATES PATENT OFFICE.

TORBJORN LINGA, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO THE LINGA COMPANY, OF WAUKEGAN, ILLINOIS, A CORPORATION OF ILLINOIS.

CARBURETOR.

Application filed August 22, 1925. Serial No. 51,761.

My invention relates to carburetors, and similar structures and concerns more especially improvements in the form and style of construction set forth in my pending patent application Serial No. 650,744—carburetors—filed July 11th, 1923, to which reference is made for the broader or more generic claims covering many features of construction illustrated in the present case.

The instant invention pertains to features of novelty and improvement in one portion of the carburetor and concerns more especially a valve operated by or connected to the carburetor throttle valve, whereby to temporarily enrich the gaseous mixture when the throttle is suddenly opened or when the engine is laboring under a heavy load.

By this means quick acceleration of the engine can be readily obtained and satisfactory conditions will prevail under excessive load.

In order that those skilled in this art may have a full and complete understanding of the invention, both from structural and functional viewpoints, and may comprehend how the above-stated and other advantages are obtained in the new construction, in the accompanying drawings forming a part of this specification I have illustrated a desirable and preferred embodiment of the invention and throughout the several views of such drawings like reference characters have been employed to designate the same parts.

In these drawings:

Figure 1 is a central longitudinal vertical section through the new carburetor;

Figure 2 is an elevation of the valve connected to the throttle valve;

Figure 3 is a vertical cross-section through the screw-threaded plug employed in the middle of the carburetor, such section being taken at right angles to the section of the same part depicted in Figure 1;

Figure 4 is a vertical section on line 4—4 of Figure 1 on a reduced scale;

Figure 5 is a horizontal section on the broken line 5—5 of Figure 1;

Figure 6 is a plan view of the valve vertically movable by the suction exerted on the carburetor, and

Figure 7 is a plan view of the same part with its top round cover plate removed.

By reference to these drawings, it will be observed that the improved and novel carburetor or vaporizer includes the customary float chamber 10, housing the liquid-fuel supply and accommodating the usual float 11 operating the sliding valve 12 through the lever connections 13, 13 to control the inlet-passage 14 whereby to maintain a substantially-constant liquid-fuel level 15 in the chamber, the passage or connection 14 being equipped with the common screen 16 and with a pipe connection 17 to the main source of fuel supply.

This float or supply chamber 10 has the familiar removable cover 18 normally demountably held in position by a leaf-spring 19 which may be rocked by its handle 21, when desired, into inoperative position, thus permitting the removal of the cover, all of which is of the well-known and familiar construction.

The carburetor includes also a chamber or compartment 22 (Figure 1), the lower internal portion of which is equipped with screw threads coacting with the threads of a plug member 23 (Figures 1 and 2) having an angular head 24 by which it may be turned and having a circular flange 25 adapted to bear on the shoulder or face 26, all as is clearly depicted in Figure 1.

This chamber 22, the lower portion of which constitutes a starting or fuel well, has two fuel discharge openings communicating with it, the lower one being characterized 27 and the upper one being denominated 28.

The passages 29 and 31 (Figure 4), respectively, of such outlets, which connect with the fuel-supply or float chamber 10, have their own individual needle-valves 32 and 33 whereby the fuel delivered through such nozzles or passages may be separately and easily governed.

In the present structure, the opening 27 is approximately one-half of an inch below the fuel level in the compartment 10, whereas the opening 28 is about one-half inch above such designated level.

As shown, the notched or fluted heads 34

of the two needle-valves specified are in co-operative relation with a pair of spring-pressed locking or holding pins 35, 35, designed to prevent unintentional turning of the valves, yet permitting their ready manual manipulation for securing the desired or required adjustments.

The bearing member 23 has openings 36 through its sides to its hollow interior, and its upright, central, cylindrical bearing 37 slidingly accommodates the hollow stem or shank 38 of a round valve 39 on its top end designed and adapted to coact with a valve-port 41 in a horizontal division or partition wall 42 of the carburetor and a trifle larger than the valve, all as is fully shown in Figure 1. When in its lowermost position substantially or nearly closing the port 41, valve 39 is supported by a shoulder 40 on its stem resting on the top of the element 23, as is illustrated in Figure 1.

Below the bearing member 23, the carburetor has a cylindrical, dash-pot chamber 43 closed at its lower end by a threaded plug or closure 44 and containing a reciprocatory plunger or piston 45 fixedly secured on the lower, solid, reduced-diameter end of the valve-shank 38. This may be conveniently done by holding it against a shoulder 49 by a castellate nut 48 locked on the valve-stem by a cotter-pin.

Such plunger or piston has a plurality of relief ports 47, 47 extended vertically therethrough whereby piston or plunger will be retarded in its reciprocatory movements only substantially sufficiently to prevent fluttering or chattering of the valve 39.

There is sufficient leakage so that the dash-pot chamber 43 is at all times filled with the liquid-fuel, drainage holes (not shown) being provided if necessary through the plug 23, whereby the appliance will operate satisfactorily in the manner stated.

The top round wall of the compartment 22, which in cross-section is of the shape indicated in Figure 1, is supplied with a central, round, air-admission aperture 51 through which the valve stem or shank extends, such hole or port 51 affording means for a downward passage therethrough of more or less of the air which flows through the carburetor.

In order that such port or opening 51 may be controlled or opened more or less as circumstances require, the hollow valve shank or stem 38 is fitted or supplied with a cone 52, which closes the port in more or less degree as the valve 39 rises under the suction to which it is submitted, thus increasing the suction in the chamber 22 at the two different-level fuel openings.

The upright cylindrical passage or mixing conduit 53, in the valve-stem 38, which is closed at its lower end, has side openings 54 therethrough connecting such internal bore or passage with an inner annular chamber 55 inside of the middle portion of the element 23, and with which the openings 36 connect, so that the chamber 22 is in direct communication with the vertical passage 53 inside of the valve-stem.

The valve member 39 has a top dished or flaring surface 56 commuicating with a central, cylindrical depression 57 in the upper face of the part 39.

Secured to and spaced slightly above the valve element 39 there is a round plate 58 of substantially the same diameter as the part 39, providing a circular discharge opening 59 between the margins of the two.

These two members are held in the relation specified by a plurality of screws 61 extended through holes in the upper part 58 and threaded into holes in the lower element 39 with suitable spacing or filler washers 62 between the two.

The lower face of the cover plate 58 has a round boss 63 projecting downwardly part way into the cavity or recess 57.

Such plate and its depending boss are apertured at 64 in alinement or register with the passage 53 to accommodate an upright valve 65 having a lower tapered or pointed end portion 66 normally extended down into the conduit 53 as shown in Figure 1.

By means of a bent arm 67, positioned wholly at one side of the center of the valve 65, the latter is hingedly supported at 68 from the under side of an oscillatory throttle-valve 69 at one side of its axis, whereby opening rocking movement of the throttle-valve lifts the valve 65, 66 and establishes freer or more open communication between the upright passage 53 and the space between the parts 39 and 58 leading to the circular discharge opening 59.

Obviously closing movement of the throttle-valve lowers the needle 65, 66 thus closing more or less the port at the top of the conduit with which it cooperates and into which it extends more or less.

The arm 67 is of the shape specified and so positioned as to escape conflict with the throttle-valve and permit a complete or full opening thereof, that is a turning thereof into vertical position.

The chamber above the valve 39 has been characterized 70 and that part of the carburetor designed to be attached to the intake-manifold has been designated 71.

The part 72 of the device is for the admission of the outside air to that portion of the carburetor above the chamber 22 and beneath the valve 39, and this part of the appliance is fitted with a choke-valve 73, which, however, need not be manipulated for starting the engine, but is sometimes required or desired for its choking effect until after the motor becomes somewhat heated up.

Valve 39 and the parts which it carries

is of constant weight, hence eliminating the use of any variable tension springs, and inasmuch as the dash-pot structure is employed to prevent the valve from fluttering or chattering rather than substantially restraining its greater movements, the lifting or raising of the valve, and consequently the opening of the valve-port 41, is dependent upon the speed of the engine and the position of the throttle-valve.

When the engine is idling and the throttle-valve is practically closed, as indicated in Figure 1, there is insufficient suction present in the carburetor to lift the constant-weight valve 39 and its associated elements.

A portion of the air entering the carburetor through the air-intake 72 flows up through the carburetor through the small opening between valve 39 and its valve seat 41, becoming mixed with the gaseous mixture as it issues from the circular discharge opening 59.

The remainder of the air passes down through opening or port 51 into chamber 22, where it becomes charged with fuel from the lower orifice 27. It then flows through the apertures 36 and 54 into the upright conduit 53, escaping from the latter, between the valve 65, 66 and its port wall, into recess 57 and from thence outwardly through the opening 59 where, as specified above, it meets and mixes with the air previously referred to, the final mixture in the chamber 70 flowing out of the carburetor into the engine where it is consumed.

Assuming that the associated engine is idling with the elements of the carburetor in the positions shown in Fig. 1, and that the throttle-valve 69 is suddenly opened, thereby immediately mechanically lifting valve 65, 66 and opening its port in like manner in substantial degree, the valve 39 rises more slowly because such movement thereof occasioned by the increased suction due to the greater speed of the engine is retarded by the dashpot mechanism.

As a result of this momentary, unusual, large opening of the port of valve 65, 66, a greater suction or depression is imposed on the fuel nozzles, thereby temporarily enriching the gaseous mixture during acceleration of the engine.

After the valve 39 has risen to its normal position for that particular speed of the engine, the fuel mixture will be properly proportioned to the operating condition of the engine.

For example, if the automobile is traveling, say, at forty miles per hour, on a level, smooth pavement, the throttle-valve will be only partially open, and the position of valve 39 will be such as to cause the port of valve 65, 66 to be open an amount giving an economical consumption of fuel by reason of the correct ratio of the constituents of the mixture for the working condition of the engine.

On the other hand, if the automobile is climbing a hill under heavy load and at slow speed, the throttle-valve will necessarily be open a greater amount and the valve 39 will not lift as far because of the decreased suction, thereby causing the port of valve 65, 66 to be open a greater amount, and hence producing a suitable, richer, gaseous mixture to enable the engine to satisfactorily perform its heavy load function.

When the valve stem 38 ascends, the upper valve 39 is opening, admitting more air, and the cone valve 52 is closing, decreasing its air admission. The relation between the opening and closing depends upon the curvatures or shapes of the two valves, and they may be so formed as to provide any ratio of fuel to air desired at each and every point of their travel.

Upon stopping the engine, the lower part of chamber 22 is filled with fuel from the lower orifice whereby a rich mixture is instantly available upon starting the engine.

This invention is susceptible of a variety of desirable embodiments and although only one preferred one has been presented in detail, the breadth of the invention is to be borne in mind as indicated by the scope of the appended claim. Stated somewhat otherwise, many minor mechanical changes may be made in the structure depicted and described without departure from the heart and essence of the invention and without the sacrifice of any of its substantial benefits and advantages.

I claim:

In a carburetor having an air-inlet port, the combination of a vertically-slidable valve co-operating with said air-inlet port and adapted to be raised to open said port by the suction present in the carburetor, said valve having an upright tubular stem, the passage through which terminates in a discharge orifice in a first chamber above said air-inlet port, means to retard the opening action of said valve, said carburetor having a second chamber to which fuel and air may be delivered and which connects with the passage through said tubular stem, a throttle-valve for the carburetor above said first chamber, a valve controlling the passage through said stem, and mechanical means connecting said throttle-valve and passage-valve, whereby opening of the throttle-valve lifts said passage-valve to increase the passage opening controlled thereby.

In witness whereof I have hereunto set my hand.

TORBJORN LINGA.