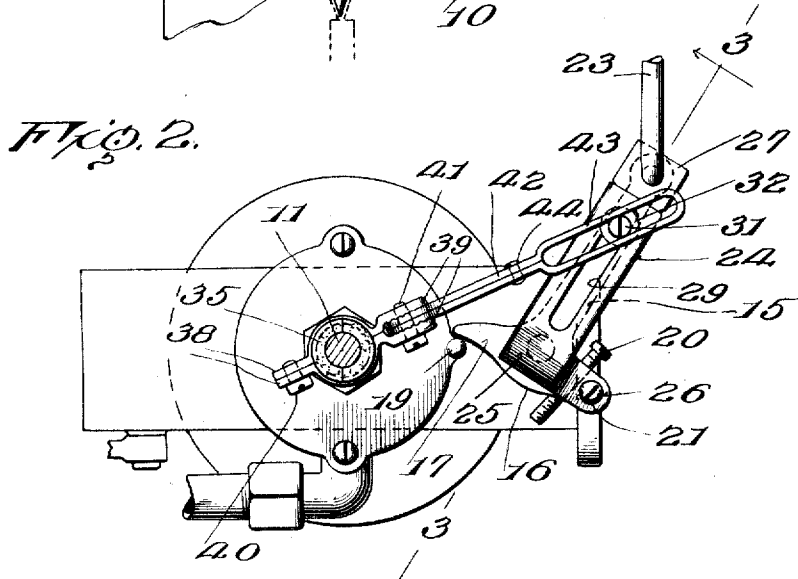
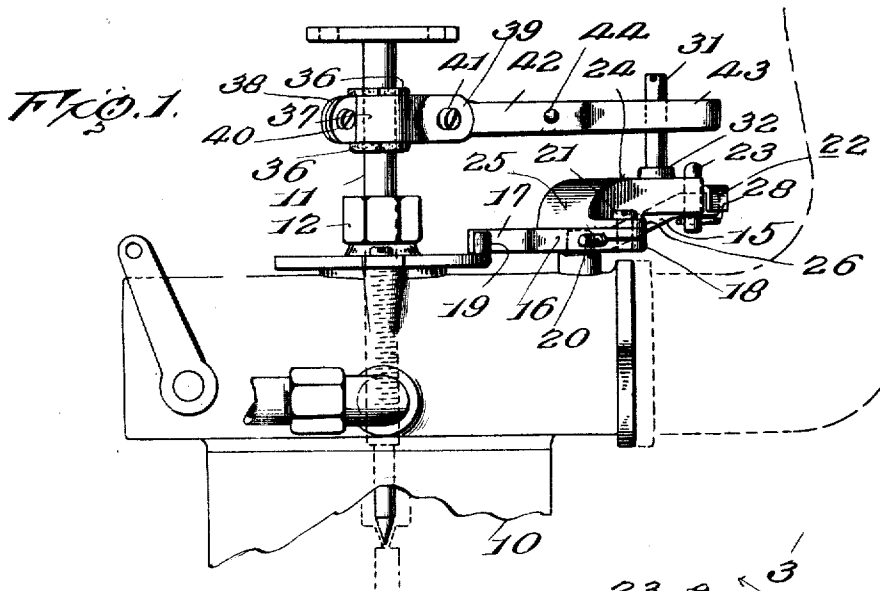


E. O. SATHER.
 CONTROL MECHANISM FOR CARBURETERS.
 APPLICATION FILED APR. 29, 1918.

Patented June 24, 1919.
 2 SHEETS—SHEET 1.

1,307,704.



Inventor

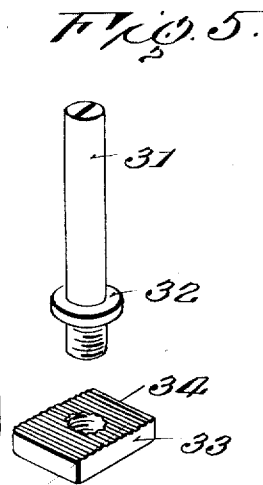
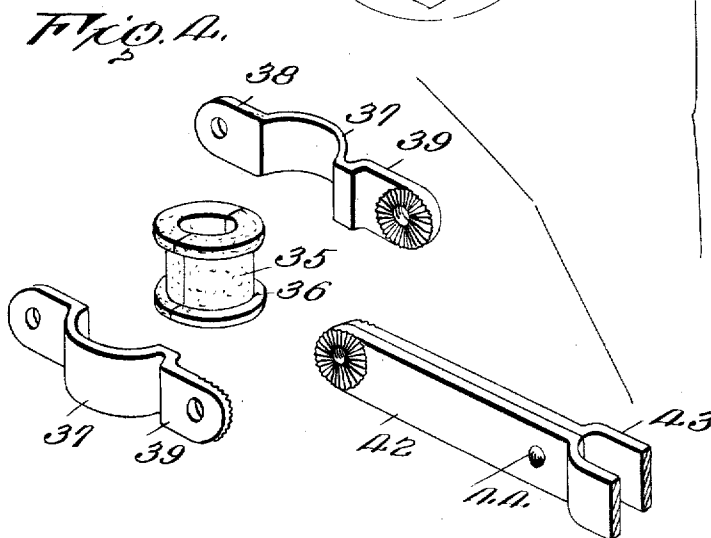
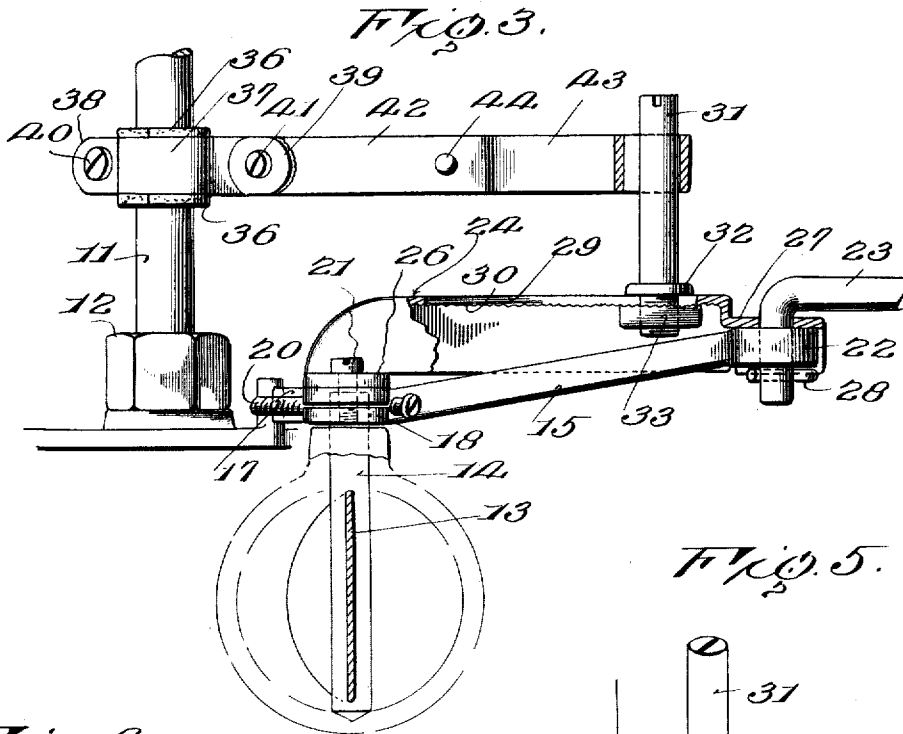
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1,307,704.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE

EDMUND O. SATHER, OF OAKLAND, CALIFORNIA.

CONTROL MECHANISM FOR CARBURETERS.

1,307,704.

Specification of Letters Patent. Patented June 24, 1919.

Application filed April 29, 1918. Serial No. 281,512.

To all whom it may concern:

Be it known that I, EDMUND O. SATHER, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Control Mechanism for Carbureters, of which the following is a specification.

This invention relates to an improved liquid fuel compensating device for carbureters and has as its primary object to provide a device of this character adapted for attachment to different types of carbureters already in use for controlling the liquid fuel valve of the carbureter synchronously with the adjustment of the throttle valve thereof to thus directly regulate the flow of fuel mixture through the carbureter according to the speed of the engine with which it is associated.

The invention has as a further object to provide a device of this character adapted to couple the needle fuel valve of the carbureter with the lever of the throttle valve thereof, whereby when the said lever is swung to open or close the throttle valve, the fuel valve will be simultaneously rotated and opened or closed proportionately to thus increase or diminish the supply of liquid fuel into the carbureter as the throttle valve is opened or closed.

A still further object of the invention accordingly resides in the provision of a device of the above described character adapted to automatically operate the fuel valve of the carbureter for increasing the richness of the fuel mixture in direct ratio to any acceleration in the speed of the engine and likewise automatically decreasing the richness of the fuel mixture in direct ratio to any slowing down of the engine speed to consequently insure a proper mixture at practically all speeds of the engine.

The invention has as a further object to provide a device wherein the opening or closing movement of the liquid fuel valve may be adjustably varied with respect to a given opening or closing movement of the throttle valve in order that the ratio of increase or decrease in the richness of the fuel mixture incident to the opening or closing movement of the throttle valve may be regulated or varied.

And the invention has as a still further object to provide a device which will be of a particularly simple nature and which may

be applied without the necessity for any structural change in the carbureter.

Other and incidental objects will appear as the description proceeds. In the drawings wherein I have illustrated the preferred embodiment of the invention, and wherein similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a side elevation showing my improved device applied to a conventional type of carbureter,

Fig. 2 is a plan view particularly showing the arrangement of the coupling arm employed between the throttle valve lever and liquid fuel valve of the carbureter,

Fig. 3 is a fragmentary sectional view on an enlarged scale particularly showing the post employed for swinging the coupling arm of the device, coincident with the swinging movement of the throttle valve lever,

Fig. 4 is a fragmentary perspective view showing the clamping members and collar employed for connecting the coupling arm with the liquid fuel valve of the carbureter, and

Fig. 5 is a detail perspective view of the coupling post.

In order that the construction, mounting and operation of my improved device may be accurately understood, I have, in the drawings, shown the device in connection with a conventional type of carbureter through the top plate of which is threaded an axial fuel valve upstanding from the carbureter. Normally, this fuel valve is rotatably adjusted manually and then fixed at adjustment by a lock nut surrounding the valve. Controlling the flow of fuel mixture from the carbureter is a throttle valve 13 of the butterfly type. This throttle valve is carried by a rotatable valve stem 14 to the upper end of which is fixed a throttle valve lever 15. The lever 15 is, at its inner extremity, provided with an enlarged head 16 upon which is formed oppositely directed lugs 17 and 18 respectively. The lug 17 is adapted to cooperate with a stop 19 upon the top plate of the carbureter for limiting the throttle valve in its movement to closed position. The lug 18 is split to provide coacting ears between which is threaded a stop screw 20 extending through the lug and adapted to be held at adjustment by a clamping screw 21 connecting the said ears. This clamping screw is

also adapted to cooperate with the stop 19 for limiting the throttle valve in its movement to open position. As particularly shown in Fig. 3 of the drawings, the throttle valve lever is inclined upwardly toward its outer extremity and, at its outer end, is formed with a pivot loop or lug 22 loosely receiving the adjacent terminal of a throttle valve control rod 23.

Coming now more particularly to the subject of the present improvements I employ a substantially channel shaped throttle valve arm 24 arranged in inverted position over the valve lever 15. This arm is preferably formed of suitable sheet metal and at its inner extremity is provided with a laterally and downwardly extending terminal 25 seating against the head 16 of the lever 15. Extending laterally at one side of this terminal is an attaching lug 26 which overlies the lug 18 of the said lever and receives the clamping screw 21 for thus rigidly connecting the inner extremity of the arm with the lever. At its outer extremity the arm 24 is provided with an offset terminal 27 overlying the pivot loop 22 of the valve lever and receiving the control rod 23 therethrough, which rod thus acts to lock the outer end of the arm in engagement with the lever. However, the lug 23 is formed at opposite sides thereof with depending attaching lugs or flanges 28 engaging around opposite sides of the pivot loop 22 for thus firmly binding the outer end of the arm upon the valve lever. The said arm will thus be rigidly connected with the valve lever to swing therewith and in this connection it is to be observed that the laterally directed terminal 25 of the arm and the offset terminal 27 thereof will cooperate to support the arm in substantially horizontal position with respect to the lever. Formed through the top wall of the arm, medially thereof, is a longitudinally extending slot 29 and, at opposite sides of this slot, the inner face of the said wall is provided with teeth or serrations 30. The arm is thus adapted to form a supporting member for an upstanding post 31 slidably fitting at its lower extremity through the slot 29 and provided with an annular collar 32 supporting the post thereon. At its lower end, the post is threaded to receive a nut 33 snugly fitting within the channel of the supporting member and held by its side flanges against turning movement. Upon its inner side this nut is provided with teeth or serrations 34 adapted to cooperate with the teeth 30. Thus, it will be seen that by rotating the post in one direction, the nut 33 thereof will be released so that the post may then be adjusted within the slot 29 longitudinally with respect to the valve lever 15 toward or away from the axis of the throttle valve. Then, by rotating the post in the opposite direc-

tion, the said post will be clamped at adjustment upon the supporting member to be held against accidental dislocation from adjusted position by the engagement of the teeth 34 of the nut 33 with the teeth 30 of the said member.

Removably fitted around the fuel valve 11 is a split attaching collar 35. This collar is preferably formed of fiber or other similar material and at its ends is provided with overhanging annular flanges 36. Engaging around the collar between these flanges is an attaching clamp including reversely bowed clamping members 37 provided at their outer ends with mating lugs 38 and at their inner ends with mating oppositely offset lugs 39. Connecting the lugs 38 of the clamping members is a screw or other suitable fastening device 40 and connecting the lugs 39 is a similar screw or other suitable fastening device 41. These screws are preferably loosely fitted through the lugs of one of the said members and threaded upon the lugs of the other of said members so that the said screws may thus be positioned for adjustably binding the clamping members about the collar 35. Consequently, this collar may be caused to grip the fuel valve sufficiently to turn or rotate the said valve from the clamp while, at the same time, the valve may be manually rotated and thus adjusted within the collar. Extending from the attaching clamp upon the fuel valve is a radial arm 42. This arm is preferably formed from a strip of suitable sheet metal bent at its outer extremity to provide a loop 43 at the inner ends of which the extremities of the strip are brought into overlapping relation and secured together by a rivet or other suitable fastening device 44. At its inner end the arm is received between the lugs 39 of the clamping members of the attaching clamp and is connected with the said lugs for pivotal adjustment upon the clamp by the screw 41 which extends through the adjacent terminal of the said arm and, preferably, the ends of the strip forming the arm are, upon the outer sides thereof, formed with annular serrated faces adapted to cooperate with similar faces upon the inner sides of the lugs for rigidly holding the arm at adjustment. The arm 42 may thus be readily positioned to extend from the attaching clamp to receive the post 31 through the loop 43 thereof, to connect the fuel valve, in the manner best shown in Figs. 2 and 3 of the drawings, with the throttle valve lever. This loop 43 in effect provides a slot in the arm slidably receiving said post so that when the throttle valve lever is swung, the post may freely shift within the said slot, it being observed, in this connection, that when the throttle valve is closed and the fuel valve occupies its normal position of adjust-

ment, the post will be disposed, as best shown in Fig. 3, medially of the slot.

As will now be readily understood, swinging movement of the throttle valve lever 15 to open or close this valve will cause the post 31 to swing therewith so that this post will, in turn, swing the arm 42 to correspondingly rotate the fuel valve 11 of the carbureter. In order that this fuel valve may be so rotated coincident with the movement of the throttle valve, the lock nut 12 for the fuel valve is, of course, loosened to release the said fuel valve. Therefore, as the throttle valve is opened or closed to accelerate or retard the speed of the engine to which the carbureter is connected, the fuel valve will be opened or closed in direct proportion to the opening or closing movement of the throttle valve. Accordingly, the fuel valve will be automatically regulated to effect an increase or decrease in the flow of fuel mixture within the carbureter in direct ratio to any increase or decrease in the speed of the engine so that as the engine speed is accelerated the richness of the fuel mixture will be proportionately increased while, when the engine speed is decreased, the richness of the fuel mixture will be proportionately decreased. A proper fuel mixture at practically all engine speeds will thus be insured. Since the fuel valve may, as previously intimated, be manually rotated independently of the arm 42, initial adjustment of this valve for regulating the normal speed of the engine may be readily had. However, in order to properly regulate the opening or closing movement of the fuel valve, under the influence of the throttle valve lever, so as to vary the travel of the valve and accordingly regulate or vary the increase or decrease in the flow of liquid fuel and consequent increase or decrease in the richness of the fuel mixture in relation to a given movement of the throttle valve, I provide the adjustment for the post 31. As will be seen, by adjusting this post inwardly upon its supporting member, the arc to be described by the post will be lessened in radius and the travel of the post with the throttle valve lever accordingly decreased. Therefore, the swinging movement imparted by the post to the arm 42 will also be decreased with a consequent decrease in the rotary adjustment of the fuel valve. On the other hand, by adjusting the post outwardly upon its supporting member, the arc to be described by the post will be increased in radius so that an increased swinging movement will be imparted to the arm 42 with a consequently increased rotary adjustment of the fuel valve. The ratio of increase and decrease in the richness of the fuel mixture with respect to an increase or decrease in the flow of such mixture may thus be readily regulated so as to attain the best results in

the operation of the engine for all engine speeds.

I, therefore, provide a particularly efficient device for the purpose set forth. Furthermore, it will be noted that my improved device is particularly simple in construction and may be readily applied to different carbureters of conventional type without the necessity for any structural change therein.

Having thus described the invention, what is claimed as new is:

1. A device of the character described including a supporting member adapted for rigid connection to the throttle valve lever of a carbureter to overlie the lever extending longitudinally thereof, an arm adapted for attachment to a carbureter fuel valve, and means carried by said supporting member and coacting with said arm to form an operative connection therebetween for swinging the arm from said member.

2. A device of the character described including a supporting member adapted for rigid connection to the throttle valve lever of a carbureter extending longitudinally of the lever, an arm adapted for attachment to a carbureter fuel valve, and means carried by said supporting member and coacting with said arm to form an operative connection therebetween for swinging the arm from said member, said means being slidably adjustable upon the member for varying the travel of the arm.

3. A device of the character described including a supporting member adapted for rigid connection to the throttle valve lever of a carbureter, an arm adapted for attachment to a carbureter fuel valve, and a post carried by said supporting member and slidably engaging said arm to form an operative connection therebetween for swinging the arm from said member.

4. A device of the character described including a supporting member adapted for rigid connection to the throttle valve lever of a carbureter, an arm adapted for attachment to a carbureter fuel valve and provided with a slot, and means carried by said supporting member and loosely engaging in said slot to form an operative connection between the arm and member for swinging the arm from the said member.

5. A device of the character described including a supporting member adapted for rigid connection to the throttle valve lever of a carbureter, an arm adapted for attachment to a carbureter fuel valve, and means carried by said supporting member and coacting with said arm to form an operative connection therebetween for swinging the arm from said member, the arm being swingingly adjustable in a plane at right angles to the member to cooperate with said means.

6. A device of the character described including a supporting member adapted for

attachment to the throttle valve lever of a carbureter, an attaching clamp formed of companion clamping members adapted for adjustable engagement with a carbureter fuel valve, an arm carried by said clamp, and means carried by said supporting member and coacting with said arm to form an operative connection therebetween for swinging the arm from said member.

7. A device of the character described including a supporting member adapted for attachment to the throttle valve lever of a carbureter, an arm formed from a strip of material bent to define a loop and adapted for attachment to a carbureter fuel valve, and means carried by said supporting member and loosely engaging in said loop to form an operative connection therebetween for swinging the arm from said member.

8. A device of the character described including a supporting member adapted for attachment to the throttle valve lever of a carbureter to extend radially with respect to the axis of the valve, an arm adapted for attachment to a carbureter fuel valve to extend radially therefrom, and means adjustable longitudinally upon said supporting member and coacting with said arm to form an operative connection therebetween for swinging the arm from said member.

9. A device of the character described including a supporting member adapted for attachment to the throttle valve lever of a carbureter and provided with a slot, an arm adapted for attachment to a carbureter fuel valve, and a post adjustable in said slot longitudinally of said member and coacting with the arm to form an operative connection therebetween for swinging the arm from said member.

10. A device of the character described including a substantially channel shaped supporting bar adapted for attachment to the throttle valve lever of a carbureter and provided with a slot in its body wall, an arm adapted for attachment to a carbureter fuel valve, a post fitting through said slot and provided with a shoulder coacting with the supporting member to support the post thereon, and a nut held within the channel of the supporting member and engaged with the post to connect the post with said member for adjustment in said slot longitudinally of the member, the post coacting with said arm to form an operative connection between the arm and member for swinging the arm from said member.

In testimony whereof I affix my signature.

EDMUND O. SATHER. [L. s.]

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."