P. E. KLINE.

AUXILIARY AIR FEED.

APPLICATION FILED SEPT. 15, 1919.

1,385,213. Patented July 19, 1921.

Fig. 1

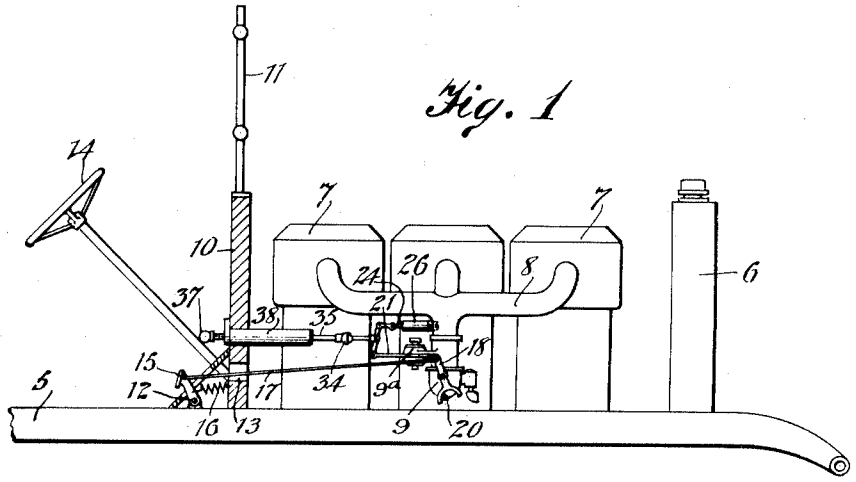
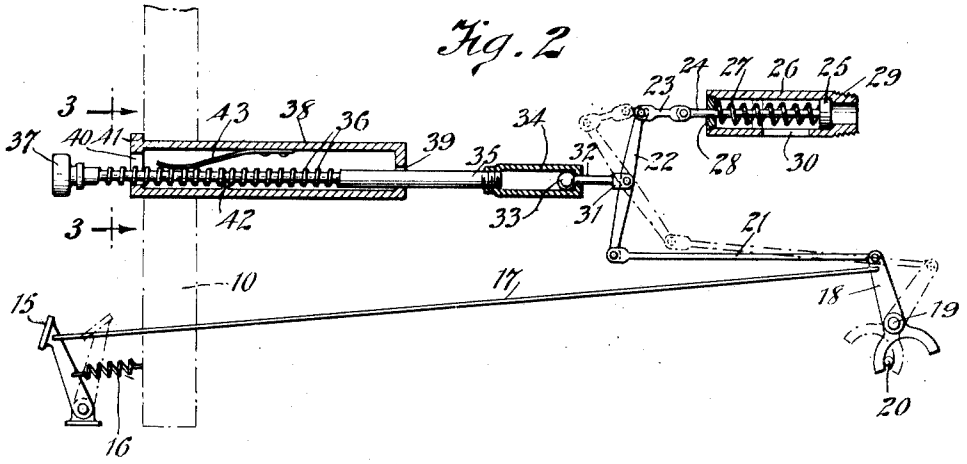


Fig. 2



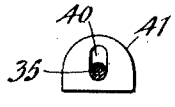


Fig. 3

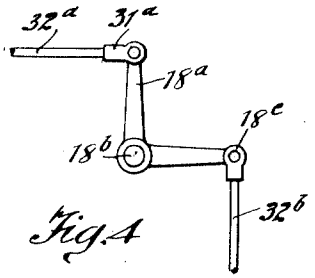


Fig. 4

WITNESSES

A. Gutzwiller

W. Harrison

INVENTOR

P. E. Kline

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

PAUL EMERSON KLINE, OF BRIDGEVILLE, PENNSYLVANIA.

AUXILIARY AIR-FEED.

1,385,213. Specification of Letters Patent. Patented July 19, 1921.

Application filed September 15, 1919. Serial No. 323,748.

To all whom it may concern:

Be it known that I, PAUL E. KLINE, a citizen of the United States, and a resident of Bridgeville, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Auxiliary Air-Feed, of which the following is a full, clear, and exact description.

My invention relates to auxiliary air feeds, that is the device is used upon internal combustion engines, and applied more particularly to such internal combustion engines as are used upon automobiles, my particular purpose being to increase the efficiency of the air feed of the engine.

More particularly stated, I seek to produce an air feed, auxiliary to a main air feed, and so arranged as to be readily under control of the operator at all times, and also arranged so as to be readily adjusted into predetermined positions and set or temporarily left standing in said position.

Reference is made to the accompanying drawing forming a part of the specification in which like reference characters indicate like parts throughout the several figures.

Figure 1 is a side view partially in elevation and partially in section showing my device as applied to an internal combustion engine of an automobile.

Fig. 2 is a vertical section through my improved auxiliary air feed.

Fig. 3 is a section on the line 3—3 of Fig. 2, looking in the direction indication by the arrows.

Fig. 4 is an elevation showing a form of bell crank which may be used as a part of my device under certain conditions.

The chassis of the vehicle appears at 5, the radiator at 6, the engine cylinder at 7 and the intake manifold at 8. The carbureter is shown at 9, and the air intake appears at 9^a. These parts being of the usual or any desired construction. The dash-board of the automobile appears at 10 and extending upwardly from which is a wind shield 11. A foot plate 12 provided with an opening 13 reaches obliquely from the chassis 5 to the dash-board 10. A steering wheel is shown at 14. The foot lever 15, used for controlling the fuel supply, extends through the opening 13 in the foot plate 12 and has the form indicated in Figs. 1 and 2. A compression spring 16 extends from the foot lever to the dash-board and tends to maintain the foot lever under tension. Connected with the foot lever 15 is an actuating rod 17 which is also connected to a lever 18 having substantially a Y shape and conveniently designated as a Y-lever. This lever is mounted upon a shaft 19 the rocking of which controls the fuel supply of the carbureter. A stop pin 20 carried by the carbureter 9 and extending therefrom serves to prevent excessive travel of the Y-lever in either of two directions. A rod 21 is connected with the upper end of the Y-lever 18 and extends rearwardly therefrom, being connected at its rear end with a straight lever 22 having generally the form of a swingle tree. This lever at its upper end is pivotally connected to a link 23, this link being pivotally connected to a valve stem 24. The valve stem 24 is provided with a valve 25 which is located within an air tube 26 into which the valve stem 24 extends. A spiral spring 27 located within the air tube 26 encircles the valve stem 24 and engages the valve 25. A spiral spring also engages a closure ring 28 which is fitted into the adjacent end portion of the air tube 26. The air tube 26 is provided with a threaded portion 29 by aid whereof it is connected with the intake manifold, as may be understood from Fig. 1. The air tube 26 is further provided with a slot 30 through which air is admitted. The air being drawn in through this slot passes directly into the intake manifold whenever the valve 25 is unseated,—that is, moved to the left according to Fig. 2. The quantity of air thus admitted depends upon several factors, one of which is the size of the slot 30 and the proportion of the slot which is rendered available for the air to pass in, this being controllable by the position of the valve 25. In other words, the further the valve 25 is moved to the left the more freely is air admitted through the slot 30 into the intake manifold.

The lever 22, has to some extent, the function of a floating lever which is journaled in a head 31 carried by a rod section 32, this rod section being provided with a ball 33 which is fitted neatly but loosely into a sleeve 34, this sleeve being carried upon a rod section 35 of considerable length. By this arrangement the rod sections 32 and 35 together constitute a rod which is rendered somewhat flexible and the length of which is variable. The rod section 35 is provided with a coarse thread 36 and with a knob 37, this knob serving as a handle. The rod sec-

tion 35 extends loosely into a sleeve 38, this sleeve being provided with two openings 39 and 40 through which the rod extends. The opening 40 has the form of a slot with rounded ends, as may be understood from Fig. 3, so that the rod section has a little vertical play through this opening. The sleeve 38 is provided with an enlarged end portion 41 which is flush with the adjacent surface of the dash-board 10. The sleeve 38 is provided internally with a thread 42 which extends between the convolutions of the threads 36, as indicated in Fig. 2. The operator by grasping the knob 37 can turn the rod section 35 so as to slowly move this rod section in a direction either to the right or left, according to Fig. 2. A leaf spring 43 is mounted within the sleeve 38 and presses gently upon the threaded portion of the rod section 35. This normally keeps the threads 36 of the rod section in proper mesh with the thread 42 of the sleeve. The slight vertical play allowed the rod section 35 by the shape of the opening 40 is also allowed for by the flexibility of the ball 33 and sleeve 34 above described.

The operator can manipulate the rod section 35, by means of the knob 37, in two distinct ways. By grasping the knob and lifting the rod section he can free the threads 36 of the rod section from the threads 42 of the sleeve and this done he can draw the rod section out or push it back to the full limit of its travel, or to any lesser extent. Again without lifting the rod section 35 he can grasp the knob 37 and by turning it in a clockwise direction, or in a contraclockwise direction, as the case may be, he can force the rod section 35 inwardly or draw it outwardly by imperceptible gradations to a very slight extent, or otherwise as he sees proper.

With various parts in their respective normal positions the operator by grasping the knob 37 and turning the rod section 35 can so adjust the parts that the valve 25, though seated, is in such condition that a very slight pull upon it will dislodge it from its seat. When this is done the various movable rods are taut and then when the foot lever 15 is actuated by the operator's foot the swingle tree 22 is caused to swing, and the valve 25 is thus removed from its seat. When the parts are thus used the action of the auxiliary air take is under control of the foot lever 15.

The purpose of having the sleeve 34 movable relatively to the ball 33 is to allow the knob 37 to be pushed forwardly that is to the right according to Fig. 2—so as to throw the air valve out of action and still allow the foot lever 15 to control the supply of fuel. With the parts in the condition just described if the foot lever 15 be released and the knob 37 grasped and pulled upward and backward however, the valve 25 will be removed from its seat although the rod 17 controllable by the lever 15 now remains stationary or in its normal position.

The slipping movement of the sleeve 34 relative to the ball 33 may be so utilized that my device acts as a brake that is to say the sleeve 34 and ball 33 together act as a swivel joint so that the rod section 35 may be turned, and still has flexibility enough to permit of a certain amount of longitudinal movement as between these parts thus the rod 17 can be moved forwardly, or to the right according to Fig. 2, without moving the valve 25 from its seat. The play between the ball 33 and sleeve 34 is sufficient to allow the ball 33 to move forward within the sleeve 34 whenever the supply of gas is increased by means of the foot lever 15 thus the swingle tree 22 is practically mounted upon a floating support.

In some makes of automobiles as for instance in those of the Ford type, it may be desirable to change the position of the air valve and parts immediately associated therewith. For this purpose I find the mechanism shown in Fig. 4 to be convenient. Instead of the head 31 carried upon the rod section 32 as elsewhere described I use a head 31^a mounted upon a rod 32^a, the head 31^a being pivoted to a bell crank lever 18^a the latter being supported upon a pin 18^b and connected with a rod 32^b, used for supporting the swingle tree. This arrangement merely changes the position and location of the swingle tree in order to adapt my device to the type of machine mentioned.

In operation my device is as follows:

The internal combustion engine is started in the usual or any desired manner, and for this purpose it is preferable to have the valve 25 in its normal position as shown in Fig. 2. With the engine once started, and the automobile in motion, the operator may or may not see proper to increase the air feed. If under the changing conditions of travel he sees proper to admit a very small portion of air independent of the supply of air always received through the carbureter, he can first adjust the rod section 35 as above described and then by pressure on the foot lever 15 he can admit an auxiliary supply of air. Moreover by constantly pressing the foot lever back and releasing it he can at will control the auxiliary air supply from moment to moment as the needs of the situation may require.

Again he can grasp the knob 37 raise it slightly to a predetermined position and then lower it, thus leaving it in a position in which it may not have to be disturbed for a considerable length of time. This done he can control the auxiliary air supply slowly through the medium of the foot lever, 15. If he desires a more accurate adjustment for the position of the rod section 35

and consequently a more accurate adjustment as to the air to be supplied under control of the foot lever 15, other things being equal, he does this by turning the knob 37 as above described so as to shift the rod section 35 by aid of the threads 36 and 42. If the automobile be running down a slight incline so that very little power is required, the operator by manipulating my device can admit an excessive quantity of cold air into the air intake thus choking down the power of the engine and conserving the fuel.

When my device is used for choking motors, as just described so as to operate as a brake, it also serves to cool off the motor.

The valve 25 as arranged and described, also serves another useful purpose in that if a back fire takes place the valve 25 is forced off its seat by the explosion so that the force of the explosion is to a great extent broken. Thus my device militates for safety in the event of such back fire. This has a tendency to save the carbureter. The advantage I present is that the gasolene is not blown away from the inlet in the carbureter, and as a consequence likelihood of a skip in the explosions is greatly diminished.

It will be observed that my device can be adjusted with extreme nicety so as to admit any desired quantity of air over and above that which is always supplied by the carbureter.

I do not limit myself to the precise mechanism shown, as variations may be made therefrom without departing from my invention, which is commensurate with my claims.

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

1. An auxiliary air feed comprising an air tube to be mounted upon an intake manifold for the purpose of producing air intake, said air tube being provided with a stop, a valve mounted within said air tube and movable relatively thereto for the purpose of controlling the amount of air drawn into said tube, a stem connected with said valve, a floating lever connected with said stem, a foot lever, mechanism from said foot lever to said floating lever for actuating said floating lever in order to control said valve, and mechanism controllable at the will of the operator for shifting the position of said floating lever.

2. A device of the character described comprising a valve for controlling the admission of air into an intake manifold, a lever connected with said valve for opening and closing the same, adjusting means controllable at the will of the operator for bodily shifting said lever and actuating mechanism independent of said means also controllable at the will of the operator for rocking said lever.

3. A device of the character described comprising a lever, means for mounting the same upon an intake manifold, a rod connected with said lever for actuating the same, means controllable at the will of the operator for actuating said rod, a second lever, a connection therefrom to said first mentioned lever, a valve controllable by said second mentioned lever for admitting air into the intake manifold, a rod connected with said second mentioned lever, and mechanism controllable at the will of the operator for adjusting said rod into a plurality of different positions.

4. A device of the character described comprising a valve for admitting air into an intake manifold, a lever connected with said valve for controlling the same, mechanism connected with said lever for locking the same in different positions at the will of the operator, a rod pivotally connected with said lever and provided with a universal joint, said rod being also provided with a thread, a sleeve through which the threaded portion of said rod extends, said sleeve being provided with a thread mating with the thread of said rod, and means for enabling the operator to turn said rod.

5. A device of the character described comprising a valve, a lever for actuating said valve connections for actuating said lever, a rod connected with said lever and made in relatively rotatable and lengthwise shiftable sections, one of said sections being provided with a thread and being revoluble, a stationary member provided with a thread engaging the first mentioned thread, and a handle mounted upon said threaded section for turning the same.

6. A device of the character described comprising an air tube to be mounted upon an intake manifold for admitting air thereinto, a valve mounted within said air tube for controlling the supply of air therethrough into said intake manifold, a lever connected with said valve for actuating the same, mechanism connected with said lever controllable at the will of the operator for rocking said lever, a rod pivotally connected with said lever and forming its working fulcrum, a support for said rod, and means controllable at the will of the operator for adjusting the position of said rod bodily in relation to said support therefor to shift the fulcrum of said lever.

PAUL EMERSON KLINE.