May 12, 1931. A. SWINGLE 1,804,521

INTERNAL COMBUSTION ENGINE

Filed Feb. 23, 1928

Fig. 1.

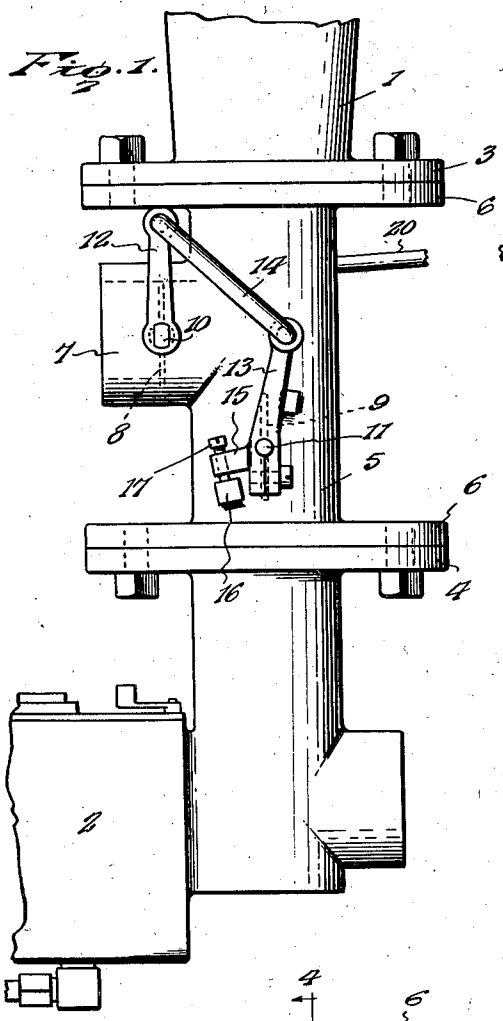


Fig. 2.

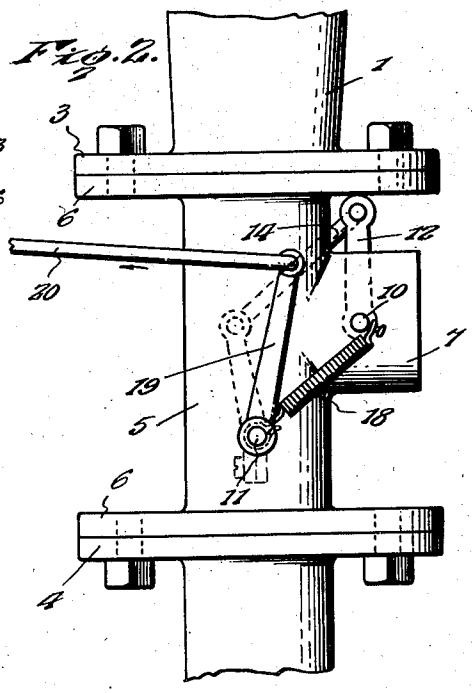


Fig. 4.

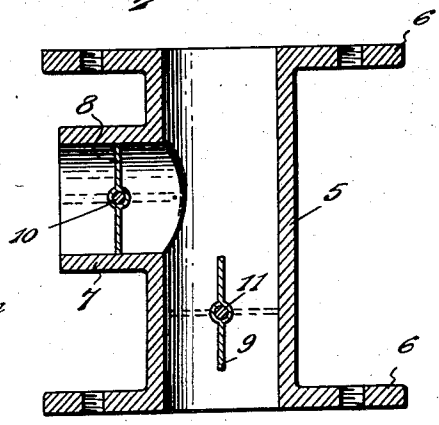
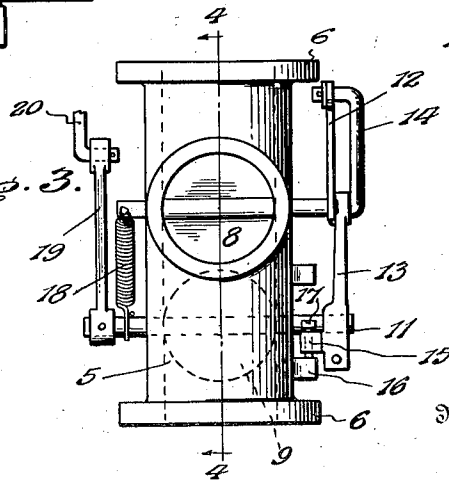


Fig. 3.



Inventor

A. Swingle.

By Lacey & Lacey, Attorneys

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1,804,521

UNITED STATES PATENT OFFICE

ARCHIBALD SWINGLE, OF ROUNDUP, MONTANA

INTERNAL COMBUSTION ENGINE

Application filed February 23, 1928. Serial No. 256,426.

This invention relates to means for controlling the passage of fuel to an internal combustion engine and has for its object the provision of a very simple device whereby the admission of the combustible mixture may be cut off and outside air simultaneously admitted to the engine to cool the engine and permit its use as a brake when descending steep grades. The invention is illustrated in the accompanying drawings and will be hereinafter set forth.

In the drawings:

Figure 1 is an elevation of my device showing the position of the same relative to the intake manifold and the carburetor of the engine;

Fig. 2 is a similar view showing the opposite side of the device;

Fig. 3 is an elevation of the device taken at a right angle to Figs. 1 and 2, and

Fig. 4 is a longitudinal section on the line 4—4 of Fig. 3.

Referring particularly to the drawing, the reference numeral 1 indicates a portion of the intake manifold of an internal combustion engine, and 2 indicates a carbureter which may be of any preferred or approved form and supplies a combustible mixture to the manifold. In carrying out the present invention, there is interposed between the flange 3 of the manifold and the flange 4 of the carbureter a sleeve or tubular body 5 provided with flanges 6 at its ends whereby it may be securely bolted to and between the flanges 3 and 4, as clearly shown in Figs. 1 and 2. Between its ends, the sleeve 5 is constructed with a lateral nipple or nozzle 7 which is open to the atmosphere and within this nozzle is mounted a butterfly valve 8 which normally extends diametrically across the nozzle, as shown in full lines in Fig. 4, so as to cut off the entrance of outside air. A similar butterfly valve 9 is mounted within the sleeve 5 below the nozzle or nipple 7, and this valve is normally in open position, also as shown in full lines in Fig. 4. The stems 10 and 11 of the respective valves extend through and are rotatably mounted in the walls of the tube and nipple and, at one side of the tube, crank arms 12 and 13 are secured firmly to the respective stems so that upon actuation of the crank arms the valves will be rocked, as will be understood. A link 14 is pivotally attached to the outer ends of the cranks 12 and 13, as shown in Fig 1, so that the valves will be actuated simultaneously. The crank arm 13 on the stem 11 of the valve 9 is provided with an offset lug 15 adapted to impinge against one stop lug 16 formed upon the side of the tubular body or sleeve, the crank arm being disposed to impinge against another similar lug, as shown in Fig. 1, so that the movement of the valve 9 will be limited and the valve cannot be rocked to such an extent that it will return to the open position and then move beyond the same so as to cut off the flow when flow is desired. To compensate for wear or irregularities in manufacture, a set screw 17 is mounted in the lug 15 and adapted to engage the cooperating stop lug 16, as clearly shown in Figs. 1 and 3. At the opposite side of the sleeve or tubular body 5, a retractile spring 18 is secured to the end of the valve stem 10 in such manner that it tends to hold the valve always in the closed position, the spring being mounted at some fixed point upon the sleeve which point may conveniently be the valve stem 11, as will be understood upon reference to Figs. 2 and 3. Attached to the end of the valve stem 11 at the side remote from the crank arm 13 is an operating crank arm or lever 19 to the upper free end of which is attached a connecting rod 20 which extends to the floor of the vehicle and is there attached to a foot pedal of any approved form located adjacent and at the left side of the clutch pedal.

It will now be seen that the spring 18

holds the parts normally in the positions shown in Figs. 1 and 2 and in full lines in Fig. 4, and ordinarily there will be no reason for shifting the parts from these positions. Should the engine race or the vehicle assume a dangerous speed, the undesirable conditions may be checked by pressing upon the pedal connected with the rod 20 so that the valve 9 will be rocked to the position shown by dotted lines in Fig. 4, thereby throttling the flow of fuel to the engine without making it necessary to disturb the adjustment of the carbureter or of any of the parts cooperating therewith and without cutting off the ignition. When the valve stem 11 is rocked to throw the valve 9 into throttling position, the movement of the same is transmitted through the crank arm 13 to the link 14 and thence to the crank arm 12 so that the valve 8 is simultaneously rocked to the position shown in dotted lines in Fig. 4 and fresh air at once admitted to the manifold and thence to the several cylinders of the engine. The cylinders will, consequently, be cooled and the air admitted thereto will tend to check the movement of the pistons so that the engines will operate as brakes to retard the vehicle. When the chauffeur actuates the valve, he employs his left foot and necessarily removes it from the clutch pedal. Should he then desire to open the clutch in order to shift gears, he will have to remove his foot from the pedal controlling the valves 8 and 9 and the spring 18 will then at once return the valves to the normal position so that the gears cannot be shifted when the engine is dead.

My device is exceedingly simple in the construction and arrangement of its parts and may be produced and installed at a low cost and may be easily operated and is highly efficient when operated.

Having thus described the invention, I claim:

A device of the character described comprising a tubular body adapted to be secured in the path between the carbureter and intake manifold of an internal combustion engine and having attaching means at its ends, a tubular side arm leading from said body intermediate its ends and open to atmosphere, upper and lower butterfly valves located respectively in said arm and in the body below the arm, pivot rods for said valves journaled in walls of the arm and body with their ends projecting outwardly therefrom, a lever fixed upon one end of the rod for the upper valve, a lever clamped about the corresponding end of the rod for the lower valve and adjustable circumferentially thereof, means to limit swinging movements of the last-mentioned lever when secured in a set position upon its rod, a pitman link having its ends pivotally engaged with free ends of said levers and causing simultaneous movements of the levers and valves, an actuating lever engaged about the other end of the lower rod, a pin projecting transversely from the corresponding end of the upper rod, and a spring having one end engaged about the last-mentioned end of the lower rod and other end engaged with said pin and exerting pull thereon to yieldably retain the valves in a normal position of adjustment with one valve open and the other closed.

In testimony whereof I affix my signature.

ARCHIBALD SWINGLE.