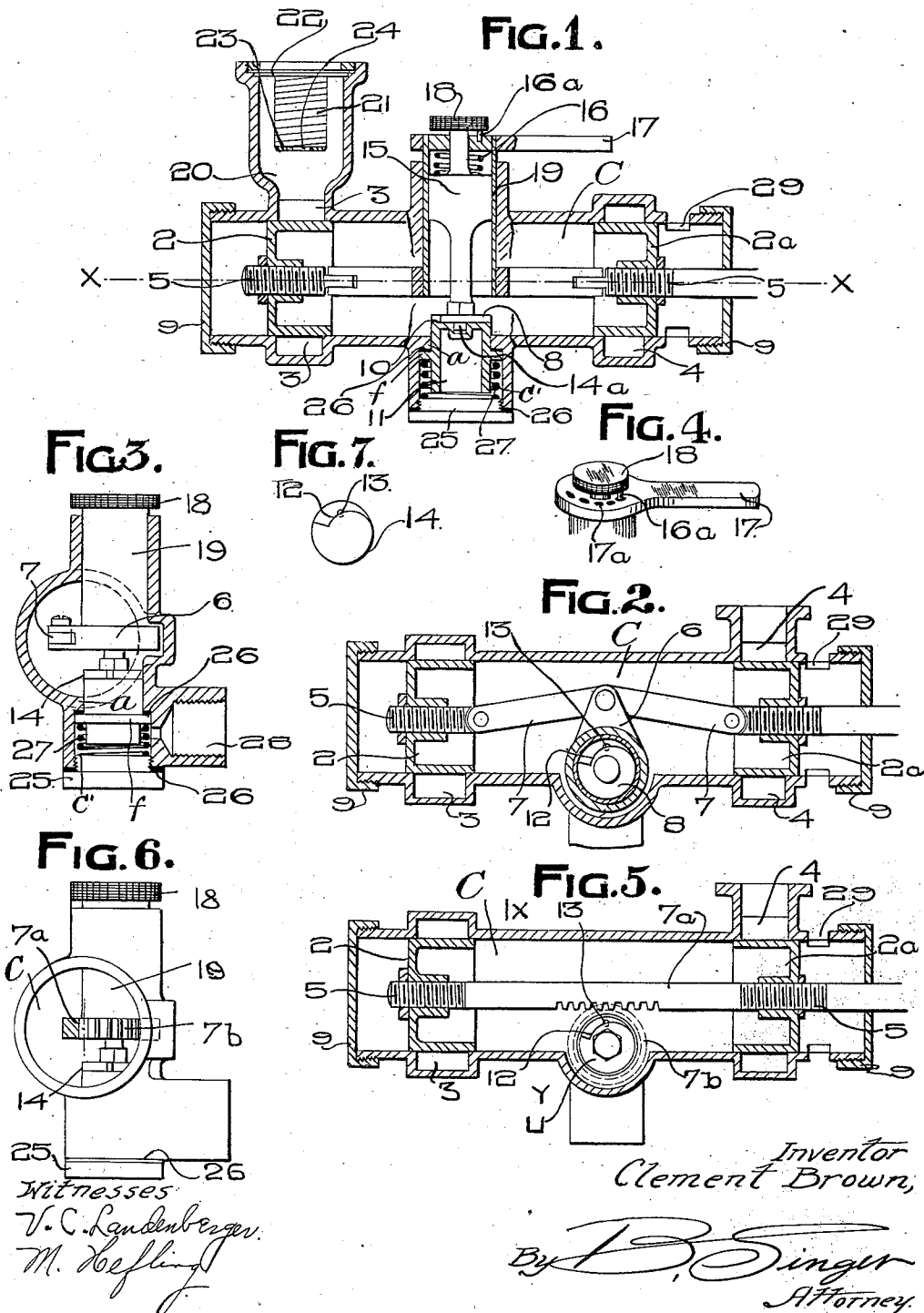


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CARBURETER.

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CLEMENT BROWN, OF BIRCHFIELD, BIRMINGHAM, ENGLAND.

CARBURETER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLEMENT BROWN, a subject of the King of Great Britain, residing at Birchfield, Birmingham, in the county of Warwick, England, have invented certain new and useful Improvements in or Relating to Carbureters Such as are Used with Internal-Combustion Engines, of which the following is a specification.

10 This invention comprises improvements in or relating to carbureters such as are used with internal combustion engines and have a jet controlled by a rotatable member mounted thereon.

15 According to the present invention the regulating edge of the rotatable member is adapted to vary the fuel orifice by virtue of the curved or helical shape of the said member whereby upon relative rotation being set up the regulating edge gradually advances across the fuel orifice, or vice versa. Such curved or helical shape readily assists in producing a variation in the exposed or effective area of the fuel orifice at any given position of the member operating the jet, as a slight relative rotation of either the jet or the rotatable member, as the case may be, has the effect of creating an increase in area, or the reverse according to the adjustment desired, of the fuel orifice. Said adjustment is particularly valuable when employed in a carbureter in which the throttle member is operatively coupled with the variable jet as by its incorporation with the adaptation of the carbureter to any particular engine or to fulfil certain conditions is rendered far easier than has hitherto been the case when no adjustment is provided. Further I preferably so provide for said adjustment that the same can be effected by the simple movement of a lever and during the working of the engine.

25 In order that this invention may be clearly understood and more readily carried into practice, reference may be had to the appended explanatory drawing, upon which—

Figure 1 is a vertical longitudinal section through the preferred form of my carbureter according to the present invention. Fig. 2 is a sectional view on the line $x-x$ of Fig. 1. Fig. 3 is a central vertical section through a modified form of jet controlling means similar to that illustrated in Fig. 1. Fig. 4 is an enlarged perspective view of a detail of the carbureter shown

in Fig. 1. Fig. 5 is a similar view to Fig. 2 showing a modified form for connecting the jet and controlling members. Fig. 6 is an end elevation of the carbureter shown in Fig. 5. Fig. 7 is a plan view of the jet regulating member used in connection with the device shown in Fig. 1.

In the carbureter as illustrated in the drawing a housing provides a conduit C with pistons or short sleeves 2 and 2^a near each end, said pistons being coupled to a common operating member so as to move in unison and thereby concurrently regulate the main air intake 3 and mixture outlet ports 4, or in other words regulate the flow of fluid through conduit C.

Each piston is connected to the operating means by screw threads 5 which enable it to be independently adjusted in relation to the port which it controls, an oscillatory arm 6 being intermediate and connected to the pistons by short pivoted links 7, said arm being also adapted to rotate the curved member 8 which controls the effective area of the fuel orifice. Another method of operating the pistons and variable jet is by a rack 7^a, Figs. 5 and 6, connected with the pistons and engaging with the pinion 7^b on the rotatable member 19 of the jet. The extremities of the housing may conveniently be closed by screw caps 9.

The top 10 of the jet 11 is flat and the rotated cut off member 8 is disk shaped, see Fig. 7, the edge 12 of the latter being of a cam shape or cut away form so as to uncover at the full open position the fuel aperture 13 in the top of the jet. From the full open position the edge of the disk assumes a cam contour until it merges into the periphery 14 of the disk, so that as the cut off edge rotates, the latter gradually advances and covers the fuel aperture, this movement taking place concurrently with the closure of the throttle.

By disposing the cut off edge on the periphery of the rotated member I am enabled to form the said edge by milling or the like whereby its manufacture is greatly facilitated.

A spigot 14^a, Fig. 1, is formed on one of the members and is adapted to engage a faucet on the other member to retain the rotative member and jet in alinement, the cut off member 8 being extended in an upward direction and connected to the throttle member 2^a by means which allow the ex-

posed area of the fuel orifice to be adjusted independently of the throttle member. An outer sleeve or cylinder 19 is arranged concentrically with and connected to the outward extension 15 of the cut off member 8 by means of a spring 16, and key 16^a, an operating lever 17 having a series of key receiving recesses 17^a shown in Fig. 4 for the key 16^a being attached to the outer sleeve or cylinder. To adjust the cam 8, the knurl top 18 of the cam extension 15 is grasped and lifted against the resistance of the spring 16, then turned and released so that the key 16^a engages with one of the recesses 17^a in the top of the lever 17. Liquid fuel enters a chamber C' by an aperture 28, Fig. 3, said chamber C' and conduit C having an abutment therebetween while fiber washers 26 between a flange f on jet 11 in conjunction with a screw cap 25 and spring 27 prevent egress of fuel except through the aperture 13.

29 is a pure air port which when the control member 2^a is moved to the extreme left allows uncarbureted air to pass into the annulus 4 and thence to the engine.

The auxiliary air supply is admitted to the carbureter so as to pass over the jet and may enter by the same port 20 as the main air, a device for regulating the auxiliary air supply consisting of a spiral spring 21 attached to a plate 22 at one end and free at the other, a plate 23 being provided at the free end of the spring 22 and perforated by a hole 24.

I will now proceed to describe the adaptation of the carbureter according to the invention, to an internal combustion engine.

The motor is run at its normal speed and the jet adjusted by hand from the exterior of the carbureter by means of the lever 17 or its equivalent, such adjustment being effected without dismantling any part during the time the motor is working. The throttle member 2^a after removal of the corresponding housing cap is moved along the screw 5 to the position in which the engine is supplied with sufficient mixture to keep it slowly revolving when declutched, the intake piston 2 being then adjusted to admit the volume of air relative to the opening of the mixture outlet so as to insure good carburization, such adjustment for running is also conveniently effected during the working of the motor. The carbureter having now been adjusted by entirely independent means for normal and slow running, it only remains to compensate for the increased vacuum obtaining when the engine is run-

ning at a very high speed and this is effected by the automatic air valve aforedescribed. As it is only desirable to admit auxiliary air at the highest speed and to preclude the induction of the same at other speeds, the hole 24 is of an area sufficient to admit only the volume of air requisite for normal speed, thus the normal air enters through the interior of the spring, whereas the supplementary air passes between the coils owing to the extension of the spring which takes place when the demand for air exceeds that which the hole 24 is able to supply.

I claim:

1. In a fuel controlling device, the combination of means providing a conduit with a fuel inlet opening thereto, a valve for controlling and varying said inlet, a stem for said valve having a head and a key, a shell revoluble about said stem, a lever rigidly connected to said shell, loosely embracing said stem below said head and provided with keying portions for coaction with the said key thereof, a spring for normally holding said valve in operative relation to said fuel inlet and retaining said key in operative relation to said lever, means for controlling passage of fluid through said conduit, and instrumentality operatively connecting said last mentioned means with said shell to actuate the former upon movement of the latter, substantially as and for the purpose set forth.

2. In a fuel controlling device, the combination of means providing a conduit with a fuel inlet opening thereto, a valve for controlling and varying said inlet, a stem for said valve, a member revoluble independently of said valve stem and concentric thereto, means for controlling passage of fluid through said conduit, instrumentality operatively connecting said last mentioned means with said revoluble member to actuate the former upon movement of the latter, and means adapted to key said revoluble member and valve stem together, but permitting adjustment therebetween whereby the position of said valve with respect to said fuel inlet may be changed relative to said revoluble member, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

CLEMENT BROWN.

Witnesses:

ARTHUR H. BROWN,
HOLLIS F. BROWN.