Feb. 3, 1925. 1,524,865

F. V. HUGHES

CARBURETOR

Filed April 9, 1921

Fig. 1.

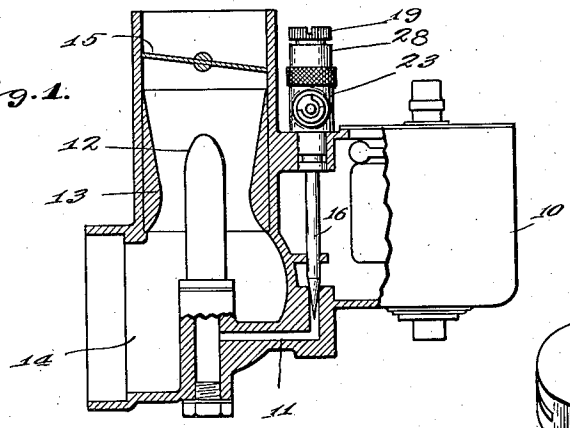


Fig. 7.

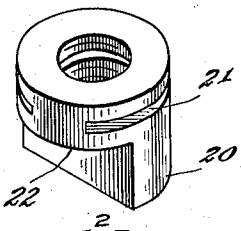


Fig. 2.

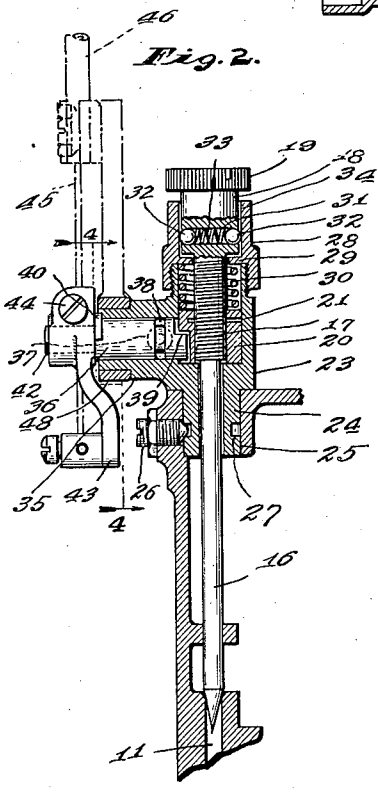


Fig. 6.

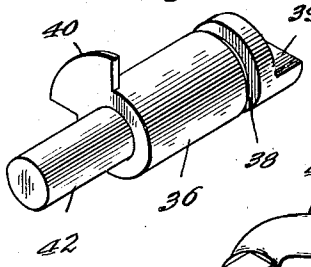


Fig. 3.

Fig. 4.

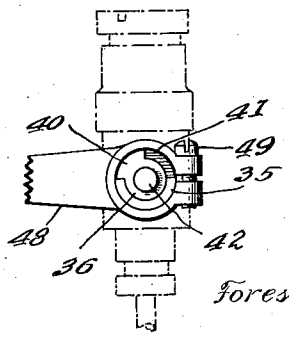
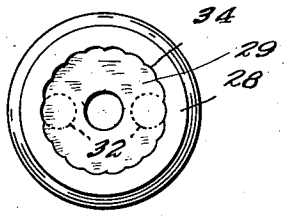


Fig. 5.



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UNITED STATES PATENT OFFICE.

FOREST V. HUGHES, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE WHEELER-SCHEBLER CARBURETOR COMPANY, INC., OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

CARBURETOR.

Application filed April 9, 1921. Serial No. 459,890.

To all whom it may concern:

Be it known that I, FOREST V. HUGHES, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Carburetor, of which the following is a specification.

It is the object of my invention to provide a fuel-control needle for carburetors, which needle may be adjusted for any desired normal setting, and may be manipulated when desired to produce a greater opening for the fuel flow without interfering with such normal setting, and which manipulating means may be extended from the needle in any direction without affecting the needle setting or operation.

The accompanying drawings illustrate my invention: Fig. 1 is a semi-diagrammatic sectional view through a carburetor equipped with a needle embodying my invention, all the parts except the needle proper being shown only conventionally; Fig. 2 is a longitudinal section through the needle mounting, being taken substantially on the line 2—2 of Fig. 3; Fig. 3 is an elevation of the needle and its mounting; Fig. 4 is a section on the line 4—4 of Fig. 2, but with the stem in elevation; Fig. 5 is an enlarged plan of the cupped cap in which the needle is mounted, the needle itself being removed; Fig. 6 is an enlarged perspective view of the stem of the needle-raiser; and Fig. 7 is an enlarged perspective view of the nut in which the needle has a screw-threaded mounting.

The carburetor may be of any desired type, ordinarily including a float chamber 10 from which fuel is supplied by a passage 11 to a fuel nozzle 12 which suitably discharges within a venturi 13 in the air passageway 14, the air passage being controlled by the usual throttle 15. These parts are all shown conventionally, and may be varied or supplemented at pleasure.

The entrance to the fuel passage 11 from the float chamber 10 is controlled by a needle 16. This needle is provided with a screw-threaded shank 17 above which is a head 18 and a knurled thumb piece 19. The screw-threaded shank 17 is mounted in a nut 20, shown in detail in Fig. 7. This nut is provided with a transverse slot 21 passing almost entirely through it, so that the parts above and below the slot may be sprung slightly toward each other, by the yielding of the metal joining them at one edge, so that a spring clamping action on the threaded shank 17 is obtained and wear is taken up and lost motion is eliminated between the needle and the nut. The nut 20 is cut away at the bottom on one side, to provide a flat downwardly facing shoulder 22.

The nut 20 is slidably mounted in a cup 23, the bottom of which is provided with a central hole to allow the needle 16 to project through it, and this cup 23 has a cylindrical downward extension 24 which has a removable mounting in a circular hole 25 in the top of the float chamber 10 in line with the entrance to the fuel passage 11. The mounting of the extension 24 in the hole 25 permits the cup 23 to be turned in such hole to any desired position, in which it may be clamped by a set screw 26 cooperating with a circumferential groove 27 in such extension 24.

The upper end of the cup 23 is externally threaded, to receive a cupped cap 28 which surrounds the head 18. This cupped cap has an inwardly extending flange 29, which acts as an abutment for a compression spring 30 which presses downward on the nut 20, so that by this spring action the nut 20 is normally seated in the bottom of the cup 23. The downward pressure of the spring 30 on the nut 20 also presses together the two parts of such nut on opposite sides of the split 21, to maintain constantly the spring clamping action already referred to.

The head 18 has a transverse opening 31 through it, in opposite ends of which opening are mounted two balls 32 which are spring-pressed apart by a compression spring 33 between them. The ends of the opening 31 are preferably peaned inward slightly after the balls 32 are put in place, to prevent such balls from coming out if the needle is removed from the cupped cap 28. These balls 32 project slightly outward beyond the periphery of the head 18, and are spring-pressed by the spring 33 into engagement with the inner surface of the cupped cap 28, which inner surface is provided with longitudinal flutes 34, as is clear from Fig. 5. Thus by turning the knurled thumb piece 19 of the needle 16, such needle is adjusted longitudinally by being screwed into or out of the nut 20, and it is held in

adjusted position by the cooperation of the spring-pressed balls 32 with the flutes 34. The spring action of the spring 33 is balanced on the needle, so that no tendency to cock the needle is created.

The cup 23 has a lateral hollow projection 35 in which is rotatably mounted a needle-raising stem 36, which is held in place in the hollow projection 35 by a screw 37 cooperating with a circumferential groove 38 in such stem. The inner end of the stem 36 is cut away on its upper side to provide an upwardly facing shoulder 39 which lies beneath the shoulder 22 of the nut 20, but rather close thereto, so that when the stem 36 is rotated the two shoulders 39 and 22 engage and the nut 20 is lifted. Near its outer end the stem 36 is provided with a radially outwardly projecting stop segment 40, which lies in an annularly longer recess 41 in the outer end of the projection 35, as is clear from Fig. 4, so that the turning movement of the stem 36 is limited to the difference in the annular extent between the segment 40 and the recess 41—as shown, about 90°. The outer end 42 of the stem 36 is made slightly smaller than the remainder thereof, and on this portion 42 is clamped a split crank arm 43, the clamping being by a screw 44 acting between the two parts on opposite sides of the split. By loosening the screw 44 the crank arm 43 may be set to any angular position on the stem. The crank arm 43 is conveniently operated by a flexible wire 45, which passes through a tube 46 the end of which is clamped by a screw 47 in the end of an arm 48 which is clamped upon the round outer end of the projection 35 by being split at such mounting and provided with a clamping screw 49. By loosening the clamping screw 49, the arm 48 may be adjusted to any desired position around the axis of the stem 36, to correspond to the position to which the crank arm 43 is adjusted, so that the wire 45 and tube 46 may extend from the needle at any desired angle with respect to such stem. This provision, with the provision for adjusting the cup 23 about the axis of the needle 16 by first loosening the screw 26, makes it possible to get a universal adjustment of the direction in which the wire 45 and tube 46 extend from the carburetor, so that the carburetor may be set in any position desired with respect to the dash board or other place of control.

In operation, the parts are normally in the position shown, with the nut 20 resting against the bottom of the cup 23, and with a slight clearance between the shoulders 22 and 39. The needle 16 is adjusted for normal fuel delivery by manipulating the knurled thumb piece 19, which moves the needle axially with respect to the nut 20. When in operation it is desired to get a greater fuel supply temporarily, as for warming up the engine in starting, the wire 45 is pulled to turn the crank arm 43 in a clockwise direction from the position shown in Fig. 3, so that the shoulder 39 engages the shoulder 22 and lifts the nut 20 against the action of the spring 30, thus lifting the needle 16 and increasing the inlet opening to the fuel passage 11. If the arm 43 is swung in a clockwise direction sufficiently far, the angle between the shoulders 39 and 22 is increased sufficiently so that the nut 20 will be held in raised position without a continual pulling on the wire 45. When the engine is warmed up sufficiently, the wire 45 is pushed in again. to return the needle 16 to its normal position.

I claim as my invention:

1. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable and is spring-pressed to a seat in the bottom of the cup, and means for shifting said nut against its spring pressure longitudinally of the cup to increase the supply of fuel controlled by said needle.

2. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, and means for positively shifting said nut longitudinally of the cup to increase the supply of fuel controlled by said needle.

3. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, means for shifting said nut longitudinally of the cup, said needle having through it a transverse opening in which two outwardly spring-pressed balls are mounted, and an internally longitudinally fluted member with the flutes of which said balls engage to hold the needle in adjusted position circumferentially while permitting it and the nut to be moved axially.

4. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, means for shifting said nut axially to vary the needle position, said needle having through it a transverse opening in which two outwardly spring-pressed balls are mounted, and an internally longitudinally fluted member with the flutes of which said balls engage to hold the needle in adjusted position circumferentially while permitting it and the nut to be moved axially.

5. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, means for positively shifting said nut longitudinally of the cup, and a support in which said cup

is circumferentially adjustable to different fixed positions.

6. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, and a transverse rotatable stem mounted in said cup, said nut and said stem having cooperating shoulders whereby the turning of said stem shifts said nut and needle axially.

7. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, a transverse rotatable stem mounted in said cup, said nut and said stem having cooperating shoulders whereby the turning of said stem shifts said nut and needle axially, and a support in which said cup is circumferentially adjustable.

8. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, a transverse rotatable stem mounted in said cup, said nut and said stem having cooperating shoulders whereby the turning of said stem shifts said nut and needle axially, a crank arm mounted on said stem and adjustable to different angular positions thereon, and an operating wire extending from said crank arm.

9. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, a transverse rotatable stem mounted in said cup, said nut and said stem having cooperating shoulders whereby the turning of said stem shifts said nut and needle axially, a crank arm mounted on said stem and adjustable to different angular positions thereon, an operating wire extending from said crank arm, a supporting arm mounted on said cup and adjustable to different angular positions thereon about the axis of said stem, and a tube supported by said supporting arm and through which said wire guidingly extends.

10. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, a transverse rotatable stem mounted in said cup, said nut and said stem having cooperating shoulders whereby the turning of said stem shifts said nut and needle axially, a crank arm mounted on said stem and adjustable to different angular positions thereon, an operating wire extending from said crank arm, and a support in which said cup is circumferentially adjustable.

11. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, a cup in which said nut is slidable, a transverse rotatable stem mounted in said cup, said nut and said stem having cooperating shoulders whereby the turning of said stem shifts said nut and needle axially, a crank arm mounted on said stem and adjustable to different angular positions thereon, an operating wire extending from said crank arm, a supporting arm mounted on said cup and adjustable to different angular positions thereon about the axis of said stem, a tube supported by said supporting arm and through which said wire guidingly extends, and a support in which said cup is circumferentially adjustable.

12. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, said nut being partly split transversely and the two parts on opposite sides of said split being relatively sprung to provide a spring clamping action on the needle, a cup in which said nut is slidable, means for shifting said nut longitudinally of the cup, and a spring acting on said nut tending to move it in such cup and to maintain constantly such spring clamping action.

13. In a carburetor, the combination of a fuel-controlling needle, a nut in which said needle has a screw mounting, said nut being partly split transversely and the two parts on opposite sides of said split being relatively sprung to provide a spring clamping action on the needle, and a spring acting on said nut tending to spring such two nut-parts together to maintain constantly such spring clamping action.

In witness whereof, I have hereunto set my hand at Indianapolis, Indiana, this 6th day of April, A. D. one thousand nine hundred and twenty-one.

FOREST V. HUGHES.