D. BARNARD.

FEED NOZZLE FOR CARBURETERS.

APPLICATION FILED DEC. 5, 1910.

1,014,202. Patented Jan. 9, 1912.

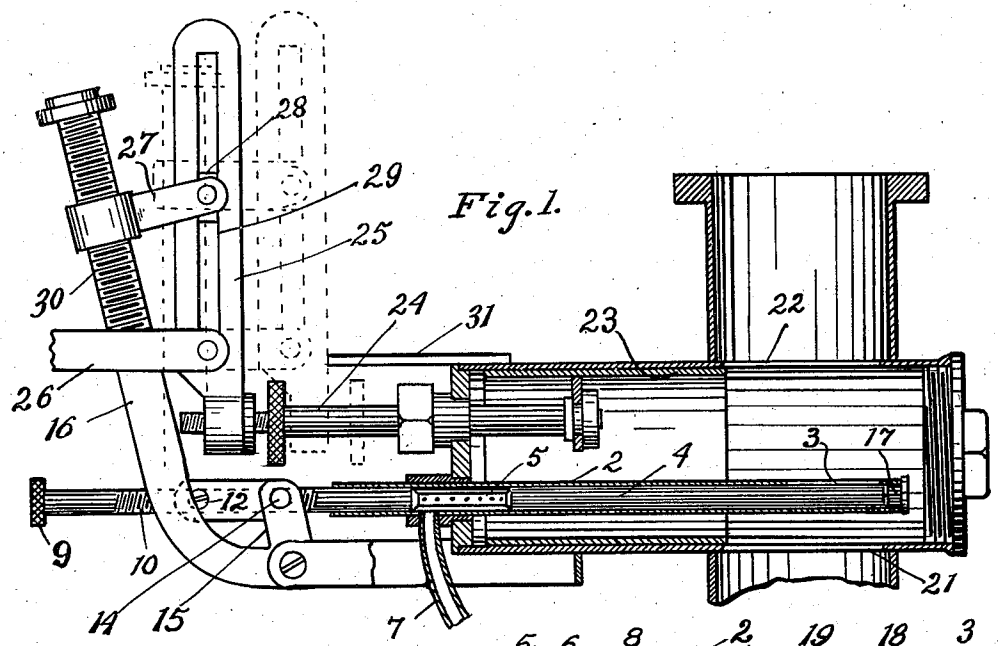


Fig. 1.

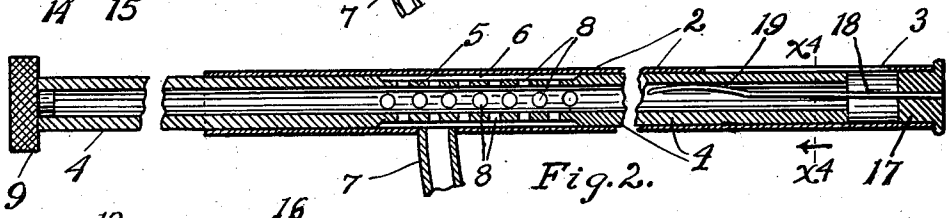


Fig. 2.

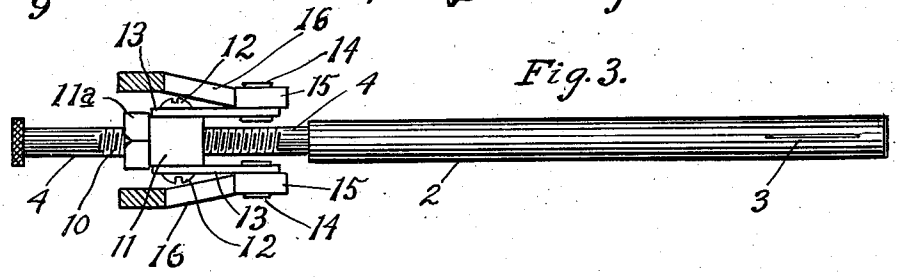
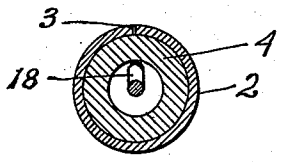


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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FEED-NOZZLE FOR CARBURETERS.

1,014,202. Specification of Letters Patent. Patented Jan. 9, 1912.

Application filed December 5, 1910. Serial No. 595,778.

To all whom it may concern:

Be it known that I, DAVIS BARNARD, a citizen of the United States, residing at Los Angeles, California, have invented a new and useful Feed-Nozzle for Carbureters, of which the following is a specification.

Among the objects of this invention are to provide a feed nozzle for carbureters that can be more easily and accurately regulated to deliver the exact amount of liquid fuel required by the carbureter, and also a nozzle that will at all times deliver a thin sheet of liquid fuel that can readily be taken up by the air in the carbureter.

Further objects are increased lightness and compactness of construction and lessened cost of manufacture.

A feed nozzle constructed according to the principles of this invention is provided with a longitudinally movable plunger to regulate the size of the feed opening, the size of said opening being varied at a uniform rate per unit of movement of said plunger.

The invention is well adapted to use on vehicles driven by internal combustion engines.

This nozzle may be assembled in combination with carbureters differing considerably in construction, but it is designed more particularly for use in combination with the carbureter described in my copending application Serial No. 581,242 filed September 9, 1910. The general construction of the carbureter herein shown is not claimed in the present application.

Referring to the accompanying drawings, which illustrate the invention: Figure 1 is a longitudinal section of a portion of a carbureter showing the casing of the nozzle in section within the chamber of said carbureter; Fig. 2 is a broken enlarged vertical section of the nozzle proper; Fig. 3 is a plan view of the nozzle on the scale of Fig. 1, showing the means for adjusting and operating the same. The bifurcated operating lever is shown in section; Fig. 4 is a cross section on line x^4 of Fig. 2, but on a still larger scale.

Referring in detail to the drawings, in Fig. 1 is shown a portion of a carbureter within which is mounted my improved feed nozzle. Said nozzle comprises a tubular casing 2 having a longitudinal feeding slot 3 the opening of which is regulated by a movable hollow plunger 4 having an open end adapted to regulate as desired the length of the feed opening afforded by said slot 3. In order to provide for supplying liquid fuel to the interior of said plunger 4, the same is made with a reduced section 5 thus forming an annular chamber 6 around that portion of the plunger. Into said annular chamber the fuel is fed by any suitable means as by the conduit 7, and from said annular chamber the fuel passes into the plunger through perforations 8 with which said reduced portion is provided.

As shown in Fig. 2, plunger 4 is closed at the left end by a milled head 9 to maintain that end of the plunger and casing closed at all times. Said plunger is provided with screw-threads 10 which engage with the threaded bore of a block 11 (see Fig. 3). Said plunger may therefore be rotated and thereby be moved longitudinally, to partially or wholly open or close feed slot 3.

11^a is a lock nut to secure the plunger in adjusted position.

Block 11 is provided with a trunnion 12 on each side thus connecting on links 13, said links being pivoted at their other ends by rivets 14 to upwardly extending arms 15 with which the lower end of bifurcated operating lever 16 is provided.

The right hand or delivery end of the tubular nozzle casing 2 is provided with a closure plug 17. In addition to forming a closure, said plug forms a support for a spring wire 18 which at all times extends into the open end of plunger 4. Said spring is provided with an upwardly bowed end portion 19 which presses against the upper side of the inner wall of the plunger to cause said plunger at all times to fit snugly against the slotted portion of the casing 2 thus preventing any escape of liquid from the portion of the slot along side the plunger.

The general construction of the carbureter shown in Fig. 1 forms no part of the present invention and will only be referred to briefly. The air enters through the inlet 21, ascends on each side of the nozzle and passes out opening 22 on its way to the engine. Said openings 21 and 22 consist of slots of uniform width, their length being simultaneously regulated by a sleeve 23 operated by a rod 24 which is

moved by an arm 25, to which is connected the operating rod 26. Said arm 25 is adjustably connected with operating lever 16 of plunger 4 of the nozzle by means of a link or yoke 27 to one end of which is pivoted a block 28 that slides in a slot 29 in arm 25, said yoke having a screw threaded engagement with a rotary sleeve 30 mounted on lever 16. A stop arm 31 limits the movement of arm 25 and lever 30 toward the carbureter. The construction just described affords means for regulating the minimum air feed and fuel feed and also for proportioning the opening and also the closing movements of the air-controlling sleeve 23 and the fuel-controlling plunger 4. The uniform width of the fuel feeding slot 3 causes the same to vary in size in equal amounts per unit of movement of the plunger 4 and insures perfect regulation.

In operation, the plunger of the nozzle is rotated by its milled head 9 to regulate the minimum spraying opening of slot 3, when arm 25 is in contact with stop arm 31, to determine the feed when the engine is running without load. This adjustment is independent of the regulation effected by the main operating rod 26 during the operation of the engine under load.

Although the invention has been described in connection with and as especially designed for a carbureter, it is not limited to such use, but may be used in other relations if desired.

Although the spraying slot of the nozzle is illustrated as being through the outer tube of the two telescopic members of which the nozzle is constructed, yet it will be understood that a nozzle constructed with the inner tube stationary and the spraying slot therethrough, would involve a mere reversal of parts and would lie within the scope of this invention. Various other changes of construction within the scope of the appended claims may be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. In a nozzle, a tubular casing having a slot extending longitudinally through the wall thereof, a hollow plunger slidably fitting within said casing and adapted to deliver liquid fuel to the slotted portion of said casing, said plunger having a cut away portion to form a chamber between the same and the wall of said casing, and means to conduct liquid fuel to said chamber, there being perforations through said plunger to conduct said fuel from said chamber to the interior of said plunger.

2. In a nozzle, an elongated cylindrical casing having a longitudinal spraying slot near one end thereof, that end of said casing being closed beyond said slot, a hollow plunger fitting within said casing, said plunger being turned down to a reduced diameter along a portion thereof within said casing spaced away from said slot to form an annular chamber around said plunger at that point, means to conduct liquid fuel to said annular chamber, there being perforations through the reduced portion of said plunger to supply fuel to the interior thereof, and means to move said plunger longitudinally to regulate the discharge opening of said slot.

3. In a nozzle, an elongated casing having a longitudinal spraying slot, a closure engaging the inner side of said slot and longitudinally movable to regulate the discharge opening of said slot, means for conducting liquid fuel to the interior of said casing, means for sliding said closure without rotating the same to regulate the size of the feed opening of said slot, and a screw-threaded connection exterior to said casing for said plunger, to provide for an adjustment independent of the sliding adjustment thereof.

4. In a nozzle, an elongated tubular casing having a longitudinal spraying slot, a hollow plunger rotatable within and longitudinally movable along said casing, means to conduct liquid fuel to the interior of said casing, means to rotate said plunger, a part located externally to said casing having a screw threaded engagement with said plunger to cause the rotation of the latter to vary the size of said spraying slot, and operating means to move said part and plunger together to vary the size of the spraying opening.

5. In a carbureter, a fuel supply comprising a tube having a longitudinal spraying slot, a hollow plunger within said tube having an open end movable along the slotted portion thereof, means for supplying liquid fuel to the interior of said plunger, and a leaf spring projecting into the open end of said plunger to hold said plunger snugly against the inner side of the slotted portion of said tube.

6. In a carbureter, a fuel supply comprising a tube having a longitudinal spraying slot, a hollow plunger within said tube having an open end movable along the slotted portion thereof, means for supplying liquid fuel to the interior of said plunger and a spring to hold said plunger snugly against the inner side of the slotted portion of said tube.

7. A nozzle comprising two telescopic members one of which has a spraying opening the size of which is regulated by varying the position of the other member, means to support one of said members in a stationary position, operating means to move the other member longitudinally, a screw-threaded connection between said movable member and the operating means therefor to

provide for a preliminary adjustment of the size of the spraying opening, said connection being located externally of the outer telescopic member and means to supply liquid fuel to the interior of the nozzle.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses at Los Angeles, in the county of Los Angeles and State of California, this 29th day of November 1910.

DAVIS BARNARD.

Witnesses:
ALBERT H. MERRILL,
LILLIAN YOUNG.