T. WHEELER.

FUEL INJECTOR FOR ENGINES.

APPLICATION FILED MAY 15, 1919.

1,362,210. Patented Dec. 14, 1920.

Fig. 2.

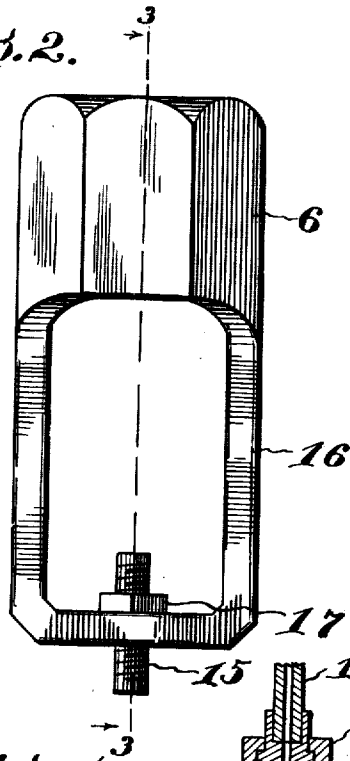


Fig. 3.

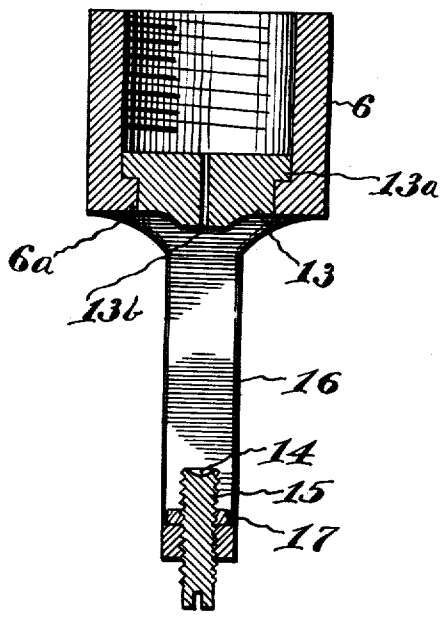
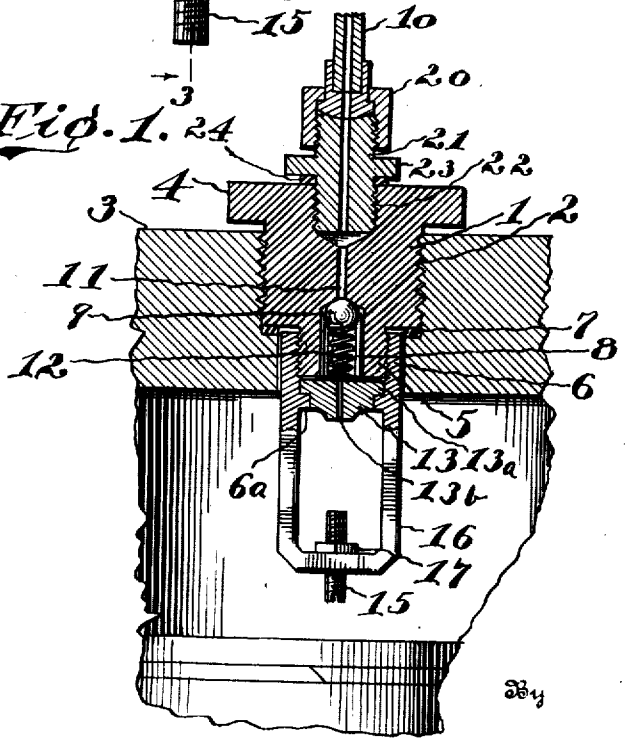


Fig. 1.



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FUEL-INJECTOR FOR ENGINES.

1,362,210. Specification of Letters Patent. Patented Dec. 14, 1920.

Application filed May 15, 1919. Serial No. 297,393.

To all whom it may concern:

Be it known that I, THOMAS WHEELER, a citizen of the United States, residing at New London, in the county of New London, State of Connecticut, have invented a new and useful Fuel-Injector for Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a device for injecting fuel into the working cylinders of Diesel engines or other engines having an analogous construction, the object of the invention being to provide a device of this character which embodies novel features of construction whereby the fuel will be atomized and broken up into a very fine spray.

Further objects of the invention are to provide a device of this character which is comparatively simple and inexpensive in its construction, which can be readily applied to the engine, which is susceptible of adjustment to obtain the most satisfactory results, and which can be readily assembled or taken apart.

With these and other objects in view, the invention consists in certain novel combinations and arrangements of the parts as will more fully appear as the description proceeds, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:—

Figure 1 is a sectional view showing the fuel injector as applied to the head of an internal combustion engine, portions of the device appearing in side elevation.

Fig. 2 is a side elevation of the nozzle carrying head and adjustable baffle member.

Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, which illustrate one possible embodiment of the invention, the numeral 1 designates a threaded plug which is adapted to be screwed into the usual opening 2 in the head 3 of an internal combustion engine. The plug is formed at its upper end with a polygonal flange or enlargement 4 which can be readily engaged by a wrench or other tool when screwing the plug into or out of position. The inner or lower end of the plug is reduced and terminates in a sleeve 5 which is exteriorly threaded and has the nozzle carrying head or collar 6 screwed thereon. The opening 2 of the cylinder head is reduced at the inner end thereof and a suitable gasket 7 fits against the shoulder which is thus formed. This gasket is engaged by the inner end of the plug 1 and enables a tight joint to be obtained between the plug and the cylinder head.

The bore or opening 8 of the sleeve 6 extends upwardly into the body of the plug 1 and communicates at the base thereof with a central fuel opening 11 which is arranged axially within the plug. The base of the bore or recess 8 forms a valve seat and a suitable check valve such as the ball 9 is held in a yielding engagement therewith by means of the spring 12. Fuel is thus permitted to enter the engine through the central passage 11 of the plug, although any backward flow of gas or fuel is prevented by the check valve.

A nozzle 13 is fitted against the extremity of the sleeve 5 and clamped in position thereon by the collar 6. The opening of the said collar is formed with an interior flange 6^a which engages a peripheral flange 13^a of the nozzle and coöperates therewith to clamp the nozzle firmly in position. The lower end of the spring 12 is shown as bearing against the nozzle, and the opening 13^b of the nozzle is comparatively small and serves to direct the fuel into the cylinder in the form of a fine jet at a high velocity. The collar 6 is shown as having a polygonal exterior formation so that it can be readily engaged by a wrench or like tool when screwing the collar into position or removing it therefrom.

The fuel supply pipe 10 has the extremity thereof attached by a conventional coupling member 20 to one end of a sleeve 21, the opposite end of the sleeve being threaded into a central recess 22 in the top of the plug 1. The middle portion of the sleeve is formed with a polygonal flange 23 which can be engaged by a wrench or like tool when screwing the sleeve into or out of position, and a suitable washer 24 is shown as interposed between this flange and the top of the plug 1, thereby insuring a tight joint between the members. The fuel supply pipe is thus placed in direct communication

with the central passage 11 of the plug, so that fuel can enter the engine through the plug, although any backward flow through the fuel supply pipe is prevented by the check valve 9.

The nozzle 13 operates to direct the fuel into the engine in a high velocity fine jet, and this jet strikes against a baffle surface such as that indicated at 14 which is formed in the head of a screw 15. The fine jet of fuel strikes the baffle surface at a high velocity and is broken up into very fine particles which instantly vaporize and form a combustible mixture. The screw 15 is shown as adjustably mounted in the cross bar of an arched or skeleton frame 16 which projects from the end of the collar 6, being integral therewith. The screw 15 can be adjusted in and out to regulate the distance between the nozzle and the baffle surface 14, and a lock nut 17 enables the screw to be held in an adjusted position. The baffle surface 14 is shown as concave, although it will be obvious that it can be of any desired shape or configuration, depending to some extent upon the specific construction of the engine and the most advantageous manner of deflecting or breaking up the fine jet of fuel. The parts projecting into the engine cylinder are formed of nickel steel or some metal which is especially adapted to withstand high temperatures, and the device can be used to advantage in Diesel engines or other engines which are constructed to operate in a similar manner.

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

A fuel injector for Diesel engines, including a plug formed with a fuel duct and having a valve chamber at the inner end of the duct, a sleeve being provided which projects from the inner end of the plug and surrounds the valve chamber, a collar threaded upon the sleeve, a nozzle fitted against the end of the sleeve and clamped in position by the collar, a check valve mounted within the valve chamber, a skeleton frame carried by the collar, and an adjustable baffle member mounted upon the skeleton frame and arranged in the path of the jet, said baffle member being movable toward and away from the nozzle.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS WHEELER.

Witnesses:
C. F. WASHBURN,
MARION G. WASHBURN.