Oct. 14, 1930. P. L. ORANGE 1,778,158

FUEL PUMP FOR INTERNAL COMBUSTION ENGINES

Filed Feb. 12, 1930

Fig. 1.

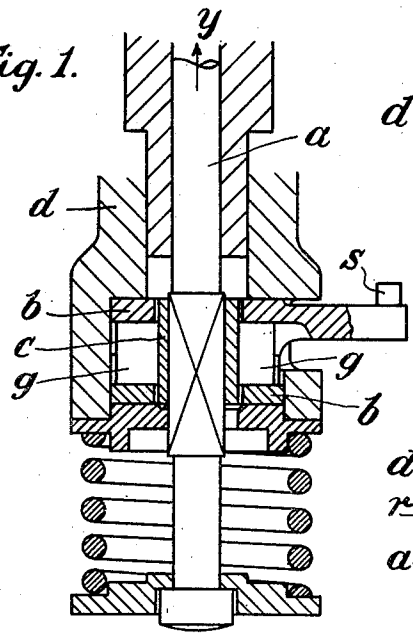


Fig. 3.

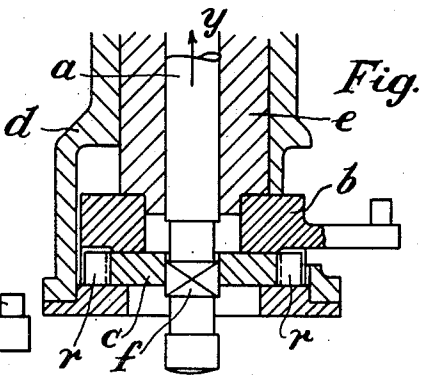


Fig. 4.

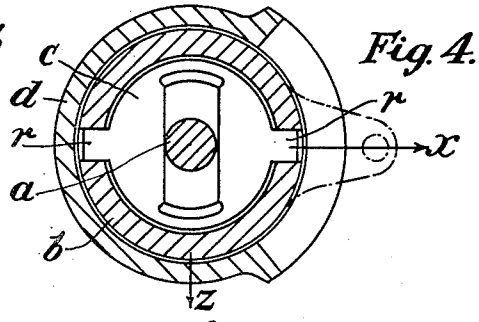


Fig. 2.

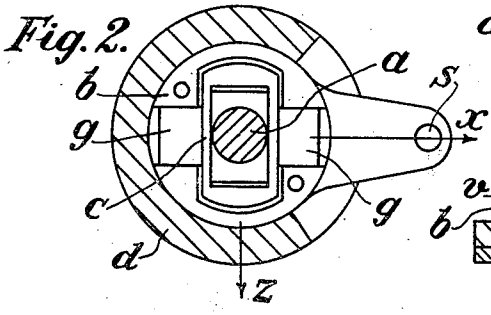


Fig. 5.

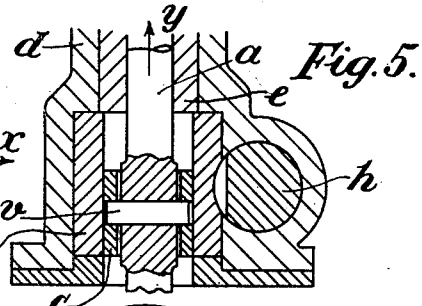
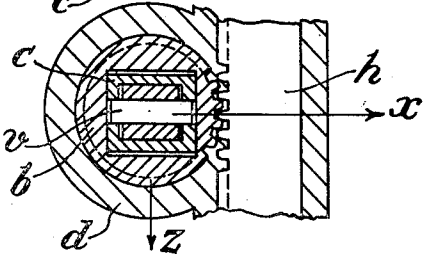


Fig. 6.



INVENTOR.

Thorpe L. Orange.

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UNITED STATES PATENT OFFICE

PROSPER L'ORANGE, OF STUTTGART, GERMANY

FUEL PUMP FOR INTERNAL-COMBUSTION ENGINES

Application filed February 12, 1930, Serial No. 427,932, and in Germany February 6, 1929.

In internal-combustion engines fed with fuel from a pump, the feed is often regulated by a rotary displacement of the pump piston. It is essential that this rotary adjustment should be effected without applying lateral pressure to the piston since the latter, which has to be carefully ground into its seat, would be subjected by such pressure to a detrimental wear.

The object of the present invention is to produce a device whereby the rotary adjustment of a piston of this kind can be effected without subjecting the piston to any lateral pressure, and the invention consists in surrounding the piston by a rotatably supported collar whereby the rotary adjustment of the piston is carried out, the motion being transmitted to the piston through the medium of a controlling member which is arranged to slide on the piston longitudinally and in one diametral direction while it is diametrically displaceable relative to the collar in a direction at right angles to that in which it is diametrally displaceable relative to the piston. This arrangement permits a universal diametral displacement of the piston relative to the actuating collar which effectively obviates any lateral pressure on the piston.

Fig. 1 of the accompanying drawings represents a longitudinal section of one form of the device,

Fig. 2 is a cross-section of the same,

Fig. 3 is a longitudinal section of a modified arrangement,

Fig. 4 is a cross-section of the latter,

Fig. 5 is a longitudinal section of a further modification, and

Fig. 6 is a cross-section of Fig. 5.

The piston a is rotatably adjusted by means of an integral or divided collar b which, in the arrangement shown in Figs. 1 and 2, is rotatably supported in a sleeve d concentric with the piston. A controlling member c is mounted on a prismatic portion of the piston so as to be adjustable on the latter longitudinally in the direction of the arrow y and diametrally in the direction of the arrow z. The controlling member is provided with diametrically opposite lugs g whereby it engages in recesses in the collar g so as to be compelled to participate in the rotation of the latter. The controlling member is diametrally adjustable relative to the collar in the direction x, i. e., at right angles to the direction z. While the piston is thus rotatably coupled to the actuating collar it is otherwise quite independent of the same and it will not, therefore, be exposed to any lateral forces. The collar has a crank arm fitted with a stud s whereby it can be rotated.

In the arrangement according to Figs. 3 and 4, the actuating collar b is mounted rotatably on the reduced end of a sleeve e arranged between the sleeve b and the piston. The latter has a prismatic portion f whereby it engages the controlling member c as previously described. The member c has the form of a disc which is fitted in a recess in the collar b and provided with lugs r which engage in notches in the surrounding rim of the collar. The elements are capable of the same relative movements as previously described.

In the arrangement of Figs. 5 and 6 the actuating collar b is again rotatably supported within the sleeve d and provided with gear teeth for engagement with an operating rack h. The controlling member c has a rectangular shape and fits a rectangular slot in the actuating collar. The member c is coupled to the piston a by means of a cross-pin v. Piston and controlling member are axially adjustable relative to the collar b and also diametrally in a direction at right angles to the pin v. The controlling member is diametrally adjustable relative to the piston in the axial direction of the pin v.

I claim:—

1. In a fuel pump of the character described for internal-combustion engines, the combination with a rotatably adjustable pump piston, of a rotatably supported actuating collar concentric with and embracing said piston, a controlling member arranged to slide on the piston in longitudinal and in one diametral direction, said controlling member being in operative engagement with the collar and capable of diametral displace-

ment relative to the latter in a direction at right angles to the direction in which it is diametrally displaceable relative to the piston, and means for turning the collar and the piston.

2. A structure as claimed in claim 1 wherein the controlling member has the form of a disc and is provided with lugs whereby it engages and co-acts with the collar.

3. A structure as claimed in claim 1 wherein the piston has a prismatic portion whereby it inter-engages with the controlling member.

PROSPER L'ORANGE.