May 9, 1939. F. EGERSDÖRFER 2,157,284

FUEL FEEDING DEVICE FOR INTERNAL COMBUSTION ENGINES

Original Filed Sept. 4, 1937 2 Sheets-Sheet 1

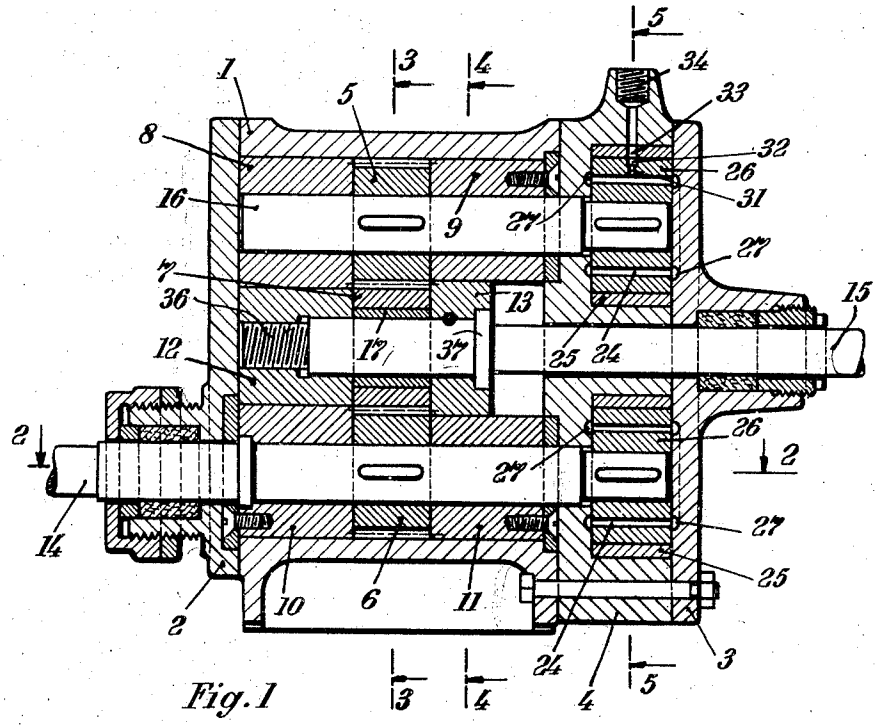


Fig. 1

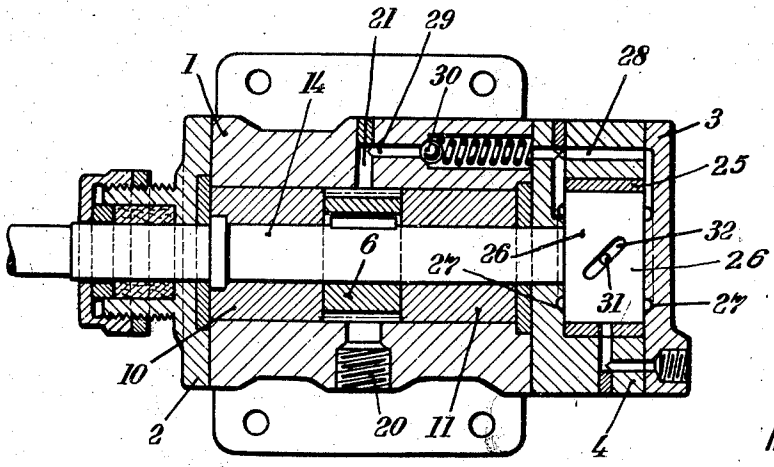


Fig. 2

Inventor
Fritz Egersdörfer
by Franz Reichert
Attorney

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FUEL FEEDING DEVICE FOR INTERNAL COMBUSTION ENGINES

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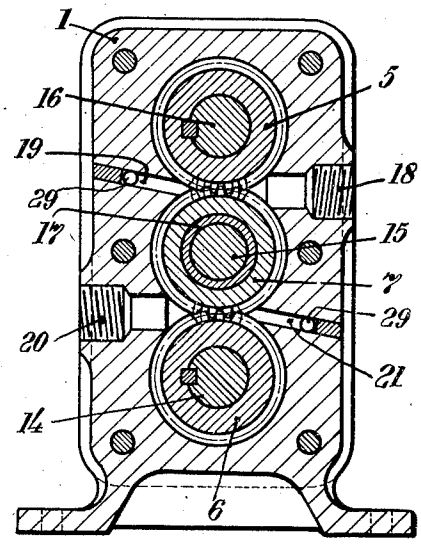


Fig. 3

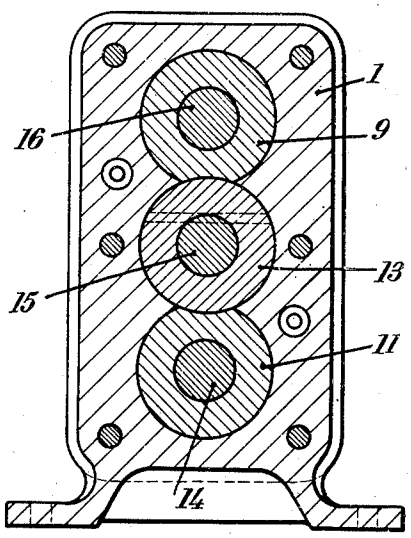


Fig. 4

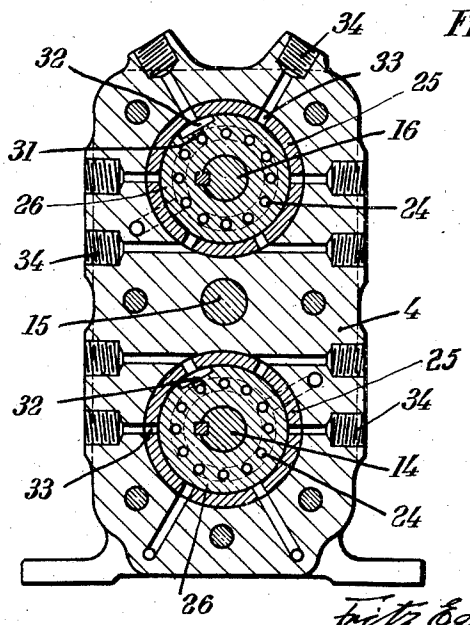


Fig. 5

Inventor

Fritz Egersdörfer

by Frank Reichow.

Attorney

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2,157,284

UNITED STATES PATENT OFFICE

2,157,284

FUEL FEEDING DEVICE FOR INTERNAL COMBUSTION ENGINES

Fritz Egersdörfer, Berlin, Germany

Original application September 4, 1937, Serial No. 162,430. Divided and this application May 18, 1938, Serial No. 208,617. In Germany September 26, 1932

1 Claim. (Cl. 103—2)

This application is derived by division from an application filed by me September 4, 1937, Serial No. 162,430.

My invention relates to improvements in fuel feeding devices for internal combustion engines, and more particularly in fuel feeding devices of the type in which the fuel is injected by means of a pump comprising pairs of inter-engaging gear wheels rotating within a common casing and having suction and pressure conduits located respectively at opposite sides of the lines of engagement of the said gear wheels, the pressure conduits of the said pump being connected with distributing members rotated by one of the driving shafts of the said gear wheels, and having ports for supplying the fuel to the cylinders of the engine.

One of the objects of the improvements is to provide simple and efficient means for regulating the amount of fuel supplied to the engine, and with this object in view my invention consists in constructing the pump with three gear wheels interengaging in pairs, a median gear wheel being in mesh with the outer gear wheels, and being adapted to be shifted in axial direction for varying the active length of the fuel feeding teeth. Thus by shifting only one of the said gear wheels the supply of fuel to two pressure conduits and to a corresponding number of cylinders is regulated.

Another object of the improvements is to provide a pump of the class indicated in which the distributing member is simple in construction and constructed so as to supply fuel to a large number of cylinders, and with this object in view my invention consists in constructing the distributing member for each sectional pump in the form of a cylindrical block carried by the shaft of the outer gear wheel and disposing both cylindrical distributing members within sockets made in a block interposed between the cylindrical casing of the pump and one of the heads thereof.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawings,

Fig. 1 is a sectional elevation showing the fuel distributing pump,

Fig. 2 is a sectional plan view taken on the line 2—2 of Fig. 1, and

Figs. 3 to 5 are sectional elevations taken respectively on the lines 3—3, 4—4, and 5—5 of Fig. 1.

In the example shown in the figures the pump comprises a cylinder 1, cylinder heads 2 and 3, a block 4 interposed between the cylinder 1 and the head 3, gear wheels 5, 6, and 7, bushings 8, 9, 10, 11, 12, and 13, a driving shaft 14 having the gear wheel 6 keyed thereto a non-rotatable shaft 15 which is axially shiftable, and which has the gear wheel 7 rotatable thereon, and a driven shaft 16 which has the gear wheel 5 keyed thereto. The shaft 15 is fixed to the bushings 12 and 13, and the gear wheel 7 is rotatable on a bushing 17 providing a spacing member for the bushings 12 and 13. As shown the shaft 15 is formed with a screw-threaded inner end 36, and it is formed with a collar 37, the bushing 12 acting as a nut clamping the parts together. The gear wheels 5 and 7 provide a pump having suction and pressure conduits 18 and 19, and the gear wheels 7 and 6 provide another pump having suction and pressure conduits 20 and 21. The volume of fuel supplied by each pump may be regulated by shifting the bushings 12 and 13 and the gear wheel 7 in axial direction.

In bushings 25 fitted in sockets of the block 4 distributing members 26 are rotatable which are keyed respectively to the shafts 16 and 14, and the said members are formed with longitudinal bores 24 opening in annular recesses 27 made respectively in the block 4 and the head 3, and the said recesses are connected by passages 28 and 29 with the pressure conduits 19 and 21, the passages 29 including spring pressed valves 30. The distributing members 26 are formed each with a radial bore 31 opening into a slot 32, and the said slots cooperate with ports 33 connected with passages 34 adapted to be connected through pipes with the cylinders of the engine. In the construction shown in the figures, and more particularly in Fig. 5, six ports 33 and passages 34 are provided for each pump, so that the fuel feeding device may be used for supplying fuel to an engine having twelve cylinders. By providing a plurality of bores 24 in the members 26 and annular recesses 27 at both sides of the said member the pressure exerted by the fuel of both sides of the members 26 is compensated, so that the friction of the members is small.

In the operation of the pump the fuel is drawn in through the suction conduits 18 and 20 and supplied to the pressure conduits 19 and 21. From the said pressure conduits the fuel is supplied through the passages 29 to the bores 24 and 31 of the blocks 26, and from the bores 31 it is successively supplied to the passages 33, 34 and the cylinders of the engine. The amount of fuel

is regulated by shifting the shaft 15 and the gear wheel so as to reduce the active length of the teeth of the gear wheels 7 and 5, 6. Thereby the supply of fuel by means of both pumps is regulated in the same way.

I claim:

A fuel feeding device for internal combustion engines, comprising a casing, a median gear wheel and outer gear wheels meshing therewith, the corresponding end faces of said outer gear wheels being respectively located substantially in the same planes, said casing being provided at opposite sides of the lines of engagement of the pairs of meshing gear wheels with suction and pressure chambers, driving means for said gear wheels, means for axially shifting said median gear wheel for varying the active length of the teeth of the meshing gear wheels, and fuel distributing members in driving connection with the outer gear wheels and respectively connected with said pressure chambers, said casing being formed with delivery passages located in position for receiving fuel from said distributing members.

FRITZ EGERSDÖRFER.