

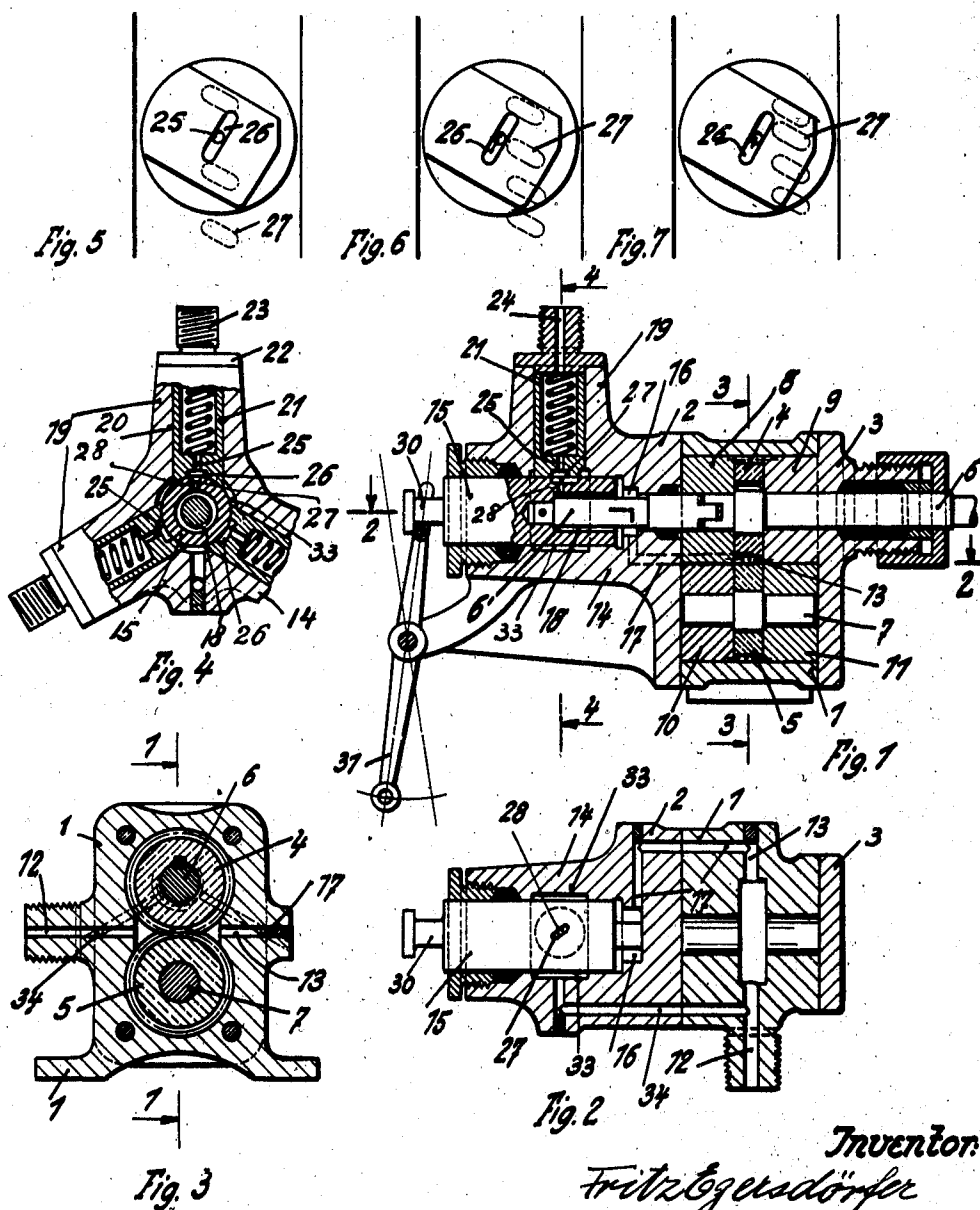
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FUEL FEEDING DEVICE FOR INTERNAL COMBUSTION ENGINES.

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## FUEL FEEDING DEVICE FOR INTERNAL COMBUSTION ENGINES

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2 Claims. (Cl. 137—153)

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. One of the objects of the improvements is to provide a device of this type by means of which accurate amounts of fuel are delivered. Another object of the improvements is to provide a device which is simple in construction and reliable in operation. Further, an object of the improvements is to provide a device by means of which the amounts of fuel can be accurately regulated in such a way that with any number of revolutions of the engine a substantially uniform mixture of fuel and air for supporting combustion is insured. With these and other objects in view my invention consists in constructing the fuel feeding device in the form of a pump comprising a pair or pairs of interengaging gear wheels rotating within a common casing and having suction and pressure conduits located respectively at opposite sides of the line of engagement of the said gear wheels, the pressure conduit of the said pump being connected with a distributing member located within the body of the pump and rotated by one of the driving shafts thereof, and having ports for supplying the fuel to the cylinders of the engine.

For the purpose of explaining the invention several examples embodying the same have been shown in the accompanying drawing in which the same reference characters have been used in all the views to indicate corresponding parts.

In said drawing,

Fig. 1 is a sectional elevation showing the feed pump and the fuel controlling member associated therewith,

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

Fig. 3 is a sectional elevation taken on the line 3—3 of Fig. 1,

Fig. 4 is a sectional elevation taken on the line 4—4 of Fig. 1,

Figs. 5 to 7 are diagrammatical plan views on an enlarged scale showing the operation of the controlling slots in the different positions of the distributing member.

The feeding device comprises a casing composed of a cylinder 1 and heads 2 and 3, and a pair of interengaging gear wheels 4 and 5 fixed respectively to a driving shaft 6 and a driven shaft 7. The said shafts are rotatably mounted in bushings 8, 9, 10, and 11 fitted within the cylinder 1, the bushing 9 being if desired made integral with the head 3. At opposite sides of the line of inter-

section of the gear wheels 4 and 5 suction and pressure conduits 12 and 13 are provided in the wall of the cylinder 1, and the suction conduit is connected with a supply of fuel.

The head 2 is made integral with a block 14 located axially of the shaft 6, and in a concentric cylindrical recess of the said block a distributing member 15 is located which is connected with the shaft 6 or a shaft section 6' connected therewith. At the inner end of the distributing member 15 a recess 16 is formed in the block 14 which is connected with the pressure conduit 13 through a passage 17, and the said recess communicates with a concentric chamber 18 made in the member 15. The block 14 is formed with radial arms 19 formed with radial sockets 20 in which plungers 21 are located, the said plungers being held by springs with their inner ends in engagement with the member 15. The sockets 20 of the lugs 19 are closed by disks 22 formed with studs 23. The said studs and the inner portions of the plungers 21 are formed with axial bores 24 and 25 respectively, and the bores 25 are connected with angularly disposed slots 26. The distributing member 15 is formed with an angular slot 27 crossing the slots 26 at right angles and connected with the chamber 18 through a bore 28. The studs 23 are externally screw-threaded, and they are connected through pipes with the fuel nozzles of the cylinders of the engine.

The distributing member 15 is axially shiftable within the block 14 for varying the relation between the slots 26 and 27 and for this purpose the member 15 is formed at its outer end with a neck 30 engaged by a lever 31, the said lever being connected with a governor or a hand operated controlling device such as the accelerator.

The shaft 6 is connected with the main driving shaft of the engine.

In the operation of the device fuel is supplied by means of the gear wheels 4 and 5 to the recess 16 and the concentric chamber 18. By the rotary movement of the member 15 the slot 27 successively establishes communication between the said chamber 18 and the bores 25, 24, so that successively regulated amounts of fuel are supplied through the said bores to the cylinders of the engine. For regulating the supply of fuel the member 15 is shifted axially by means of the lever 31. Thereby the relation of the slots 26 and 28 is varied in the manner shown in Figs. 5 to 7. In the position of the parts shown in Fig. 5 the path of the slot 27 corresponds to the position of the slots 26, and therefore fuel is supplied through the slots 26 a length of time correspond-

ing to the circumferential length of the slots 26. When the member 15 is axially shifted with the slot 27 and into the position represented in Fig. 6 the said slots communicate with each other 5 only through a reduced length of time, and therefore the amount of fuel supplied to the cylinders is reduced. When the member 15 is further shifted the slots finally get into the relative positions indicated in Fig. 7, in which no fuel is supplied.

10 The dimensions of the device are such that the gear wheels 4, 5 supply more fuel than is ordinarily needed, and the excess of fuel escapes from the controlling device through an annular recess 33 and a passage 34 to the suction passage 12, 15 the plungers 21 slightly yielding against the pressure of their springs in case of an excess of fuel being supplied to the distributing device.

I claim:

1. In a fuel-feeding device for internal-com- 20 bustion engines, fuel-distributing means including a cylindrical valve chest, a valve in the form of a cylindrical shell rotatable within and longitudinally adjustable within the valve chest, the valve chest being ported with a plurality of elong- 25 gated slots arranged in circumferential succession, and the valve being ported with an elongated slot,

the slot in the valve being angularly disposed with relation to the slots in the chest, whereby as the valve rotates the area of coincidence of the two cooperating slots advances longitudinally of the slots, and means for shifting the valve longitudinally within the valve chest. 5

2. In a fuel-feeding device for internal-combustion engines, fuel-distributing means including a cylindrical valve chest, a valve in the form of a cylindrical shell rotatable within and longitudinally adjustable within the valve chest, the valve chest being ported with a plurality of ports arranged in circumferential succession, and the valve being ported with a port adapted as the valve rotates to register with the ports in the valve chest, the valve chest including in its structure blocks yieldingly mounted in its walls, in which blocks the said ports are formed, and a pressure-relief passage, the said blocks constituting valves in a line of fuel flow from said valve chest to said pressure-relief passage, and means for shifting the valve longitudinally within the valve chest. 10 15 20

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