

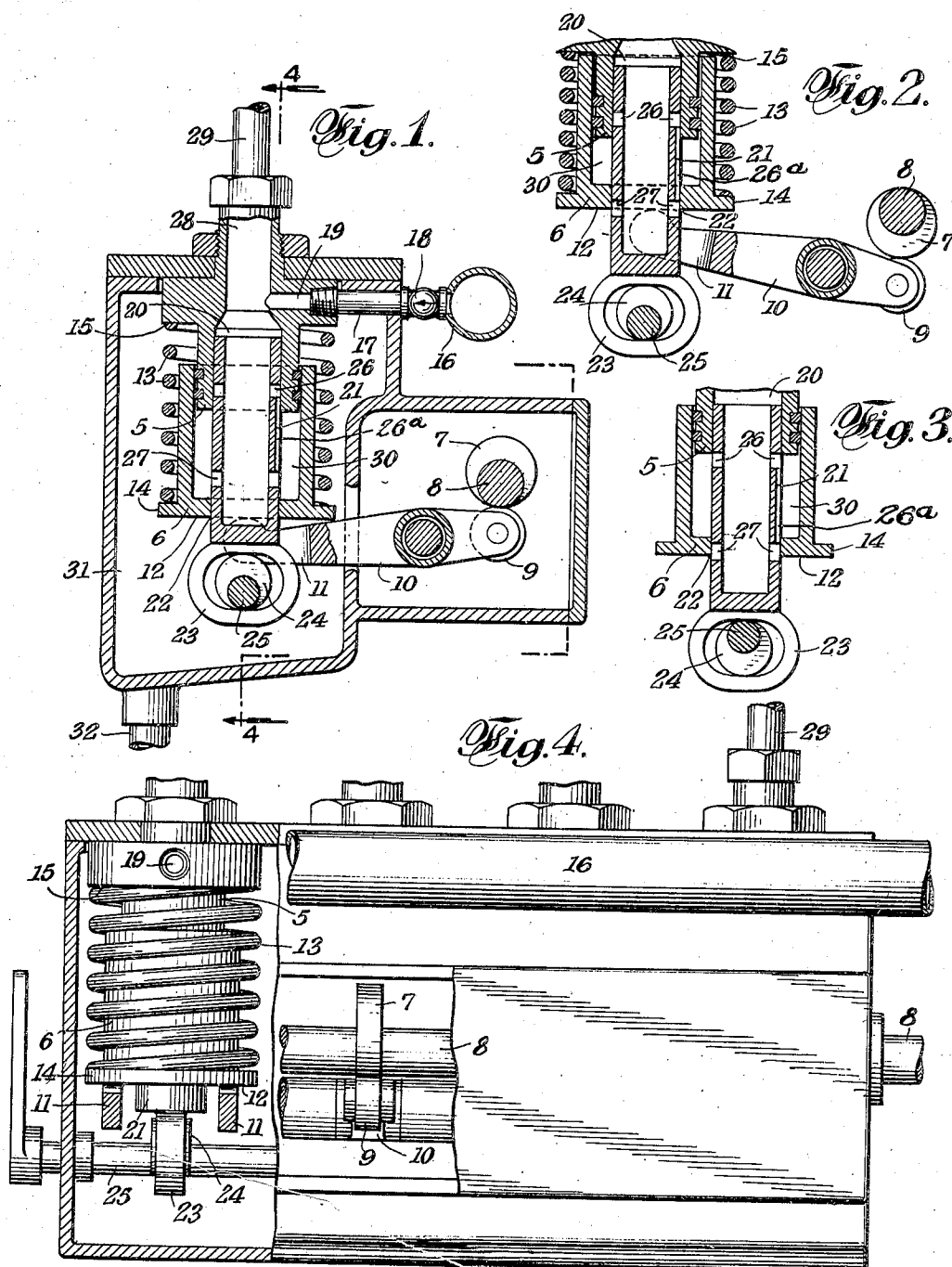
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THROTTLING PUMP

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THROTTLING PUMP

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3 Claims. (Cl. 103—41)

This invention relates particularly to fuel pumps for Diesel engines.

Special objects of the invention are to provide an improved throttling construction, which will be incorporated with and form an actual part of the pump and which will be of simple, practical design and accurate and reliable in operation.

These and other desirable objects are attained by the novel features of construction, combinations and relations of parts hereinafter described, illustrated in the accompanying drawing and broadly covered in the claims.

The drawing shows one practical embodiment of the invention and it is to be understood that the structure may be modified and changed as regards this particular illustration, all within the true intent and broad scope of the invention.

Fig. 1 is a broken sectional view of a throttling pump embodying features of the invention.

Figs. 2 and 3 are diagrammatic views illustrating other positions of the parts.

Fig. 4 is a broken side elevation with parts appearing in section as on line 4—4 of Fig. 1.

In the construction illustrated, the cooperating pumping elements consist of a stationary piston or head member 5, and a movable cylinder 6, reciprocating over said head member. The reciprocation of the cylinder 6, is effected from a cam 7, on shaft 8, operating against a cam roll 9, on one end of the pivoted rocker 10, having a fork 11, at the opposite end bearing on the head 12, of the cylinder, against the tension of spring 13, interposed between the outstanding flange 14, of said head and the shoulder 15, about the base of the piston.

In a multi-cylinder pump such as illustrated, the oil may be supplied from a suitable manifold 16, to branches 17, having suitable check valves 18, therein. These branches to the individual pumps may open to passages 19, in the bases of the stationary pump pistons.

The stationary pump element 5, is tubular in form to provide a bore or chamber 20, for receiving the throttling sleeve 21. The latter projects through an opening 22 in the head 12 of the reciprocating pump member and, for adjustment purposes is shown as having a transversely slotted head or yoke 23, receiving the eccentric 24 on the control rock shaft 25.

The throttle sleeve is shown as ported in its upper portion at 26, to clear the end of piston member 5, and as ported in its lower portion at 27, to clear the head of the movable cylinder, when the sleeve is withdrawn as in Fig. 3 and as channeled in the side at 26a between ports 26

and 27. The throttle shaft 25 may be equipped with a suitable lever or handle for rotating the same to similarly set the throttles for the several pumps in different desired positions.

The chamber or bore 20, in the stationary pump member is shown as extended as a passage 28, from which pipe 29, may be extended to the injection nozzle of the engine cylinder.

With the throttle set as in Fig. 1, substantially the full displacement of the pump will be utilized, the outstroke of the cylinder causing a full charge of the oil to be drawn through the lower sleeve ports 27, into the space between the end of the stationary member 5 and the head 12 of the movable cylinder 6. On the instroke, this full charge will be forced to the atomizer or injection nozzle of the engine cylinder up to the instant of pressure relief by the opening of ports 27, Fig. 2.

By withdrawing the throttle sleeve as in Fig. 3, the upper ports 26, can be brought into communication with the pumping space or chamber 30, and the lower ports 27, can be carried outside the range of movement of the cylinder head 12, with the result that oil taken into the pump chamber through ports 26, will simply be discharged through ports 27, into the enclosing chamber 31, from which such oil may be led through piping 32, back to the source of supply. Adjustments between these extreme positions will vary the volume of oil which is thus released and consequently the amount of oil that will be actually pumped to the engine cylinder. This throttling or bypassing effect is obtained right at the pump, the source of pressure, without shifting or varying the pump parts and with a simple rugged construction, free of any complicated or delicate parts liable to get out of order.

What is claimed is:

1. A throttling pump comprising companion relatively movable cylinder and piston pumping elements and a throttling sleeve member extending through the end of said cylinder and piston elements and ported to cooperate with both pumping elements and shiftable to vary the pumping effect of such elements and inlet and outlet connections for said pump structure the porting of said throttling sleeve including a port located and constructed to provide continuous communication between the interior of the sleeve and space between said sleeve and surrounding pumping cylinder and a port located and constructed to provide in alternate positions of the sleeve communication between the interior of the sleeve and said surrounding space within the cylinder

or communication between the interior of the sleeve and space outside both the sleeve and the cylinder element.

2. In combination with a stationary tubular pumping member, a movable pumping cylinder operating over said member and having a closed head at the outer end of the same, a throttle sleeve slidable in said member and projecting out through the head of said pumping cylinder, said throttle sleeve having a port to clear the end of the tubular member in which it is located and a port to open outside the head of the movable cylinder when said throttle sleeve is partly withdrawn from said tubular pumping member and inlet and outlet connections for said pump structure, said first sleeve port being located and constructed to provide continuous communication between the interior of the sleeve and space between the outside of the sleeve and the surrounding pumping cylinder and said second mentioned port being located and constructed to provide communication either between the interior of the sleeve and said surrounding space within the pumping cylinder or between the interior of the sleeve and exterior of the pumping cylinder.

3. A throttling pump, comprising a relatively stationary tubular piston having fluid inlet and outlet, a pumping cylinder operating over said stationary tubular piston and having a head at the outer end of the same, a throttling sleeve extending through the head of said sliding cylinder and having a sliding fit in the bore of the stationary tubular piston, said throttling sleeve being ported for cooperation with the end of the stationary tubular piston and the head of the cylinder reciprocating over the same and located and constructed to provide continuous communication between the space within said throttling sleeve and the space between said sleeve and surrounding pumping cylinder and to provide communication between the interior of the sleeve and said surrounding space or the interior of said sleeve and space outside said sleeve and pumping cylinder, means for operating said cylinder and means for variably positioning the throttling sleeve with respect to the end of the stationary tubular piston and the head of the movable pumping cylinder.

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