

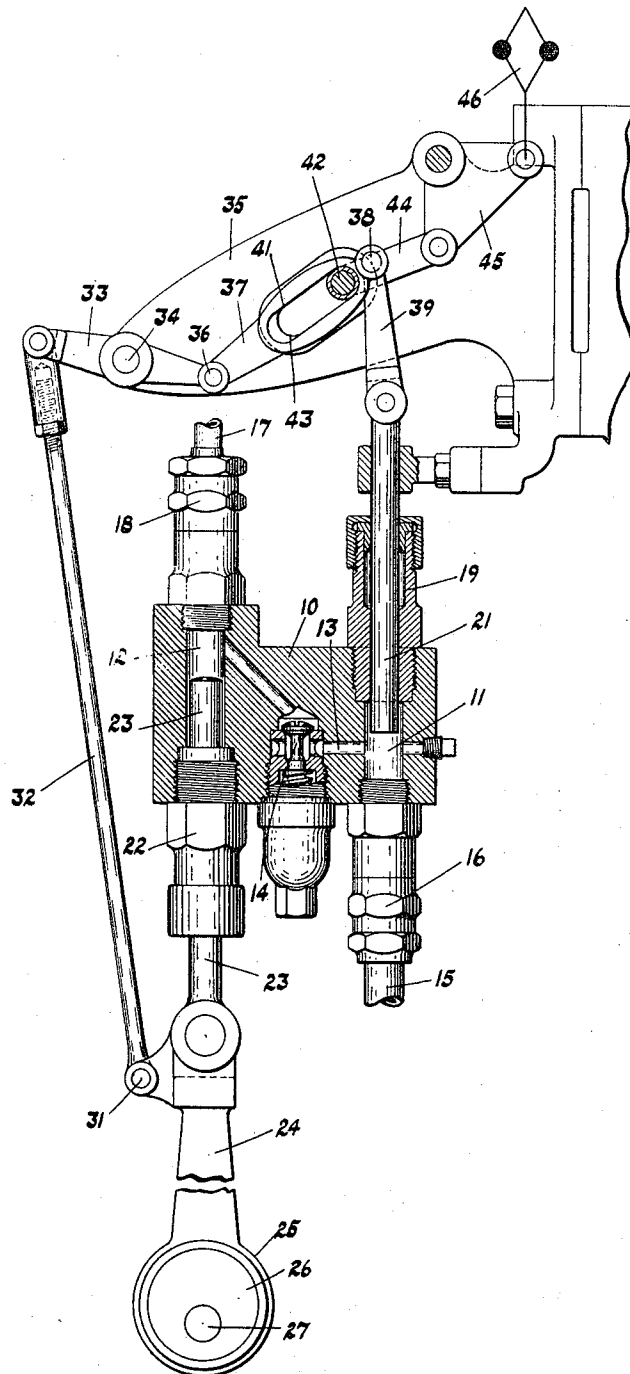
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OIL PUMP.

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950,076.

Patented Feb. 22, 1910.



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OIL-PUMP.

950,076.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NORMAN McCARTY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Oil-Pumps, of which the following is a specification.

The object of my invention is to produce a two stage pump of such character that variably measured quantities of a liquid may be delivered by the low pressure section to the high pressure section and from thence discharged against high pressure, the construction being such that the plunger of the low pressure section shall be positively actuated in both directions and the construction being also such that the variation in the action of the plunger of the low pressure section shall be under the control of a speed controlled governor in such manner that the action of the speed controlled governor shall be substantially free during all possible positions of the low pressure plunger.

The accompanying drawing, which is a side elevation in partial section, illustrates my invention.

In the drawing, 10 indicates the main body of a pump having a low pressure chamber 11, a high pressure chamber 12 and a connecting passage 13 which preferably delivers into the high pressure chamber near its outlet. Arranged in passage 13 between the high pressure and low pressure chambers is a check valve 14 which opens toward the high pressure chamber. Leading into the low pressure chamber 11 is a supply pipe 15 provided with an inwardly opening check valve 16, and leading from the high pressure chamber 12 is an outlet pipe 17 provided with an outwardly opening check valve 18. Projected into chamber 11, through a suitable packing box 19 is the low pressure plunger 21, and projected into the high pressure chamber 12 through a suitable packing box 22 is a high pressure plunger 23. Plunger 23 is adapted to be reciprocated by any suitable means, such for instance as an arm 24 carried by the eccentric strap 25 mounted upon an eccentric 26 carried by the shaft 27 operated in any suitable manner, as for instance by an internal combustion engine with which the pump is adapted to be connected for supplying variably measured quantities of liquid fuel to an atomizer structure delivering into the combustion chamber

of the engine. None of these parts are shown in the drawings for the reason that they are all of ordinary construction and form no part of my present invention.

For the practical and successful operation of my improved pump it is necessary that the plunger 21 be positively actuated in both directions and that it be operated in synchronism with the high pressure plunger, and for that reason I provide a mechanical connection between the two plungers as follows: Pivoted at 31 to plunger 23 is a rod 32 which is pivoted at its upper end to one arm of a lever 33 pivoted at 34 upon a bracket 35. The other arm of lever 33 is pivoted at 36 to one end of a lever 37 the opposite end of which is connected at 38 to the upper end of a link 39 connected at its lower end to plunger 21, the arrangement being such that the movement of the two plungers relative to their respective chambers will be opposite.

In order to vary the stroke of plunger 21, lever 37 is provided between its ends with a slot 41 adapted to receive a pin 42 which is also projected into a slot 43 formed in bracket 35, the angle of said slot corresponding to the angle of slot 41 when the parts are in the position shown in the drawings where plunger 23 has been projected to its full extent into chamber 12 and plunger 21 has been withdrawn from chamber 11 to its full extent. Pin 42 is carried by a link 44 connected in any suitable manner, as by means of lever 45, with a speed controlled governor 46 which is merely indicated diagrammatically, the arrangement being such that, when the parts are in the positions shown in the drawing, pin 42 may be shifted in slots 41 and 43 so as to vary the ratio of the two arms of lever 37 without however causing any movement of said lever. It will be seen from this arrangement that the outer position of plunger 21 will be the same in all positions of adjustment of pin 42, the variation of stroke of the plunger 21 resulting in a greater or less inward projection of the plunger from the position shown in the drawings.

With the parts in the position shown in the drawing an outward or downward movement of plunger 23 will cause lever 37 to swing on pin 42 but also cause the said lever to move to the right on said pin and, with the parts proportioned as shown in the

drawings, the resultant movement of the pivot 38 will be along the arc of a circle whose center is the point of attachment of link 39 with plunger 21 so that there will be
 5 no movement of the plunger 21 and consequently no propulsion of liquid from the low pressure chamber 11 past valve 14 into the high pressure chamber 12. By moving pin 42 to the left in slots 43 and 41, the effect
 10 of the movement of lever 37 upon plunger 21 may be gradually increased until the maximum stroke of said plunger is obtained when pin 42 lies at the left hand end of slot 43.

15 It will be noticed that there is no time when there is any material pressure exerted on pin 42 as the spring which holds valve 14 to its seat is very light and the flow from chamber 11 to chamber 12 takes place at a
 20 very small pressure.

I claim as my invention:—

1. In a pump having a high pressure chamber, a low pressure chamber, a connection between said chambers, and means for
 25 preventing back flow from the high pressure to the low pressure chamber, a check valve in the inlet of the low pressure chamber, a check valve in the outlet of the high pressure chamber, a high pressure plunger
 30 projectable into the high pressure chamber, a low pressure plunger projectable into the low pressure chamber, intermediate positive connections between the two plungers for
 35 producing positive actuation of said plungers in opposite directions relative to their respective chambers, whereby discharge from the low pressure chamber into the high
 40 pressure chamber will take place before discharge from the high pressure chamber, and means for varying the effect of said intermediate positive connections upon the low
 45 pressure plunger whereby the stroke thereof will be varied.

2. In a pump having a high pressure chamber, a low pressure chamber, a connection between said chambers, and means for
 45 preventing back flow from the high pressure to the low pressure chamber, a check valve in the inlet of the low pressure chamber, a check valve in the outlet of the high pressure
 50 chamber, a high pressure plunger projectable into the high pressure chamber, a low pressure plunger projectable into the low pressure chamber, an operating lever
 55 for the low pressure plunger, a fulcrum for said lever, means by which said fulcrum may be shifted relative to the lever to vary the arm ratio thereof, and intermediate positive
 60 pressure plunger, for the purpose set forth.

3. In a pump having a high pressure chamber, a low pressure chamber, a connection

between said chambers, and means for preventing back flow from the high pressure to the low pressure chamber, a check
 65 valve in the inlet of the low pressure chamber, a check valve in the outlet of the high pressure chamber, a high pressure plunger projectable into the high pressure chamber, a low pressure plunger projectable
 70 into the low pressure chamber, a lever connected to said low pressure plunger, a fulcrum for said lever movable lengthwise of the lever to vary the arm ratio thereof, a guide for said fulcrum, said guide registering
 75 in position with the lever when the low pressure plunger is at the outer end of its stroke whereby, in all positions of adjustment of the fulcrum the outermost position of the low pressure plunger will be the same,
 80 means by which the fulcrum may be shifted, and intermediate positive connections between said lever and the high pressure plunger.

4. In a pump comprising a high pressure
 85 ejection chamber, a low pressure measuring chamber, and a connection between said chambers, a high pressure plunger mounted in the high pressure chamber, a low pressure
 90 plunger mounted in the low pressure chamber, means for disestablishing connection between the two chambers during ejection movement of the high pressure plunger, means for automatically varying the amount
 95 of the ejecting movement of the low pressure plunger, and means for moving the low pressure plunger to a uniform outer position.

5. In a pump comprising a high pressure ejecting chamber, a low pressure measuring
 100 chamber, and an intermediate connection between said chambers, a valve arranged between said chambers to prevent flow from the high pressure chamber to the measuring chamber, a plunger arranged in the high pressure
 105 chamber, a plunger arranged in the measuring chamber, a lever engaging the low pressure plunger, intermediate connections between said lever and the high pressure plunger, a fulcrum for said lever, means for
 110 shifting said fulcrum relative to the lever to vary the effect thereof upon the low pressure plunger, and a support for said fulcrum, whereby the low pressure plunger will be always moved to a uniform outer position.
 115

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this fourth day of November, A. D. one thousand nine hundred and nine.

NORMAN McCARTY. [L. s.]

Witnesses:

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 THOMAS W. McMEANS.