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FUEL PUMP.

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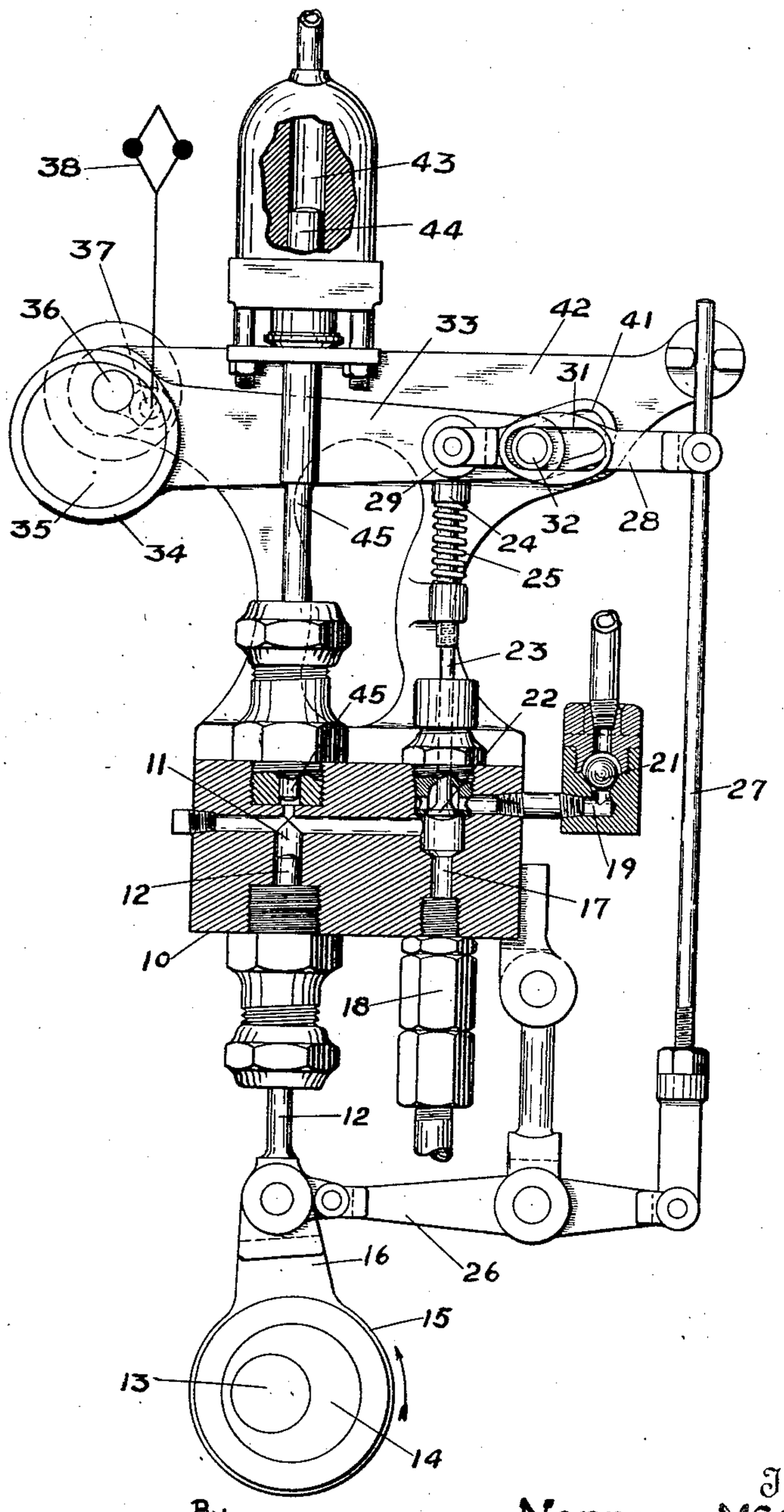
929,102.

Patented July 27, 1909.



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FUEL-PUMP.

No. 929,102. Specification of Letters Patent. Patented July 27, 1909.

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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 Fuel-Pumps, of which the following is a specification.

The object of my invention is to produce a pump by means of which variably measured quantities of material may be successively discharged therefrom.

The accompanying drawing which is an axial section, illustrates an embodiment of my invention.

In the drawings, 10 indicates the main body of the pump within which is formed a pump chamber or cylinder 11. Mounted in chamber 11 is a displacement plunger 12 which may be operated in any desired manner, preferably in a uniform stroke by means such as a shaft 13, eccentric 14, strap 15 and arm 16. Leading into chamber 11 is an inlet passage 17 provided with an inwardly opening check valve 18 and leading out of chamber 11 is a discharge passage 19 provided with an outwardly opening check valve 21. Mounted in passage 19, preferably between check valve 21 and chamber 11, is a controlling valve 22, the stem 23 of which is projected out of the main body 10 and provided at its outer end with a head 24. The spring 25 serves to urge valve 22 to its seat.

In order to control the position of valve 22 I provide a lever 26 which is connected at one end to piston 12 and at the other end to a link 27 to which is connected a lever 28 having a roller 29 at its inner end adapted to engage head 24. Lever 28 is provided with a longitudinal slot 31 into which is projected a fulcrum pin 32 carried by an arm 33 of an eccentric strap 34 mounted upon an eccentric 35 on shaft 36, which shaft is connected by a link 37 to a speed control governor 38. Fulcrum pin 32 is also projected into a slot 41 formed in a suitable supporting bracket 42. Mounted on bracket 42 is a cylinder or pressure chamber 43 in which is mounted a piston 44 which carries, at its outer end, a compensating plunger 45 which is projected into chamber 11 so that the effective volume of chamber 11 may be modified by a movement of the compensating plunger 45.

The operation of the device is as follows:—Supposing chamber 11 to be filled with oil, or other liquid, chamber 43 to be filled with a fluid, under pressure (conveniently from an air compressor commonly used in connection with internal combustion engines of the slow combustion type), and the parts to be in the positions indicated in the drawings:—movement of shaft 13 in the direction indicated by the arrow will continue the displacing movement of the displacing plunger 12 into chamber 11. Roller 29 has been just drawn away from head 24 so that spring 25 has moved valve 22 to its seat. Until valve 22 was seated, the inward movement of the plunger 12 served to drive the oil out through valve 22, the pressure upon piston 44 exceeding the pressure upon the inner end of the compensating plunger 45. But as soon as valve 22 was closed further inward movement of the displacing plunger 12 will be permitted by reason of the yield of the compensating plunger 45, this yield being only sufficient to permit the completion of the inward movement of the plunger 12. If fulcrum 32 is drawn to its extreme position toward the left, valve 22 will be kept open for maximum discharge, although not the entire inward stroke of plunger 12 and the maximum discharge of the pump will be attained, and there will be minimum yield of the compensating piston 45. By shifting fulcrum 32 to the right, the time of open position of valve 22 will be curtailed and the output of the pump correspondingly diminished. It is apparent therefore that, by a speed controlled governor adjustment of the fulcrum 32, I shall be able to attain any desired quantity of ejection from the pump and can therefore, in the use of my apparatus in connection with the atomizer of an internal combustion engine, accurately measure and deliver desirable quantities of fuel to the engine to maintain its speed under varying load conditions. On the outward or suction stroke of plunger 12 there will be no material back flow from passage 19 because check valve 21 will prevent it but before there can be any inflow from supply passage 17 compensating plunger 45 will be moved to its lowest position, as indicated in drawing.

I claim as my invention:

1. A pump comprising a main chamber, having a valved inlet and an outlet, a displacing plunger arranged in said chamber,

a compensating plunger also arranged in said chamber, means for yieldingly urging said compensating plunger to its normal inward position, a controlling valve arranged in the outlet passage, and means for controlling said controlling valve to vary its time of open position relative to the movement of the displacing plunger.

2. A pump comprising a main chamber, having a valved inlet and an outlet, a displacing plunger arranged in said chamber, a compensating plunger also arranged in said chamber, means for yieldingly urging said compensating plunger to its normal inward position, a controlling valve arranged in the outlet passage, and speed-controlled means for controlling said controlling valve to vary its time of open position relative to the movement of the displacing plunger.

3. A pump comprising a main chamber, an inlet passage therefor, an inwardly opening check valve in said passage, an outlet passage, an outwardly opening check valve in said outlet passage, a controlling valve arranged in said outlet passage between the pump chamber and outlet passage check valve, means for varying the open time of said controlling valve, a displacing plunger arranged in the pump chamber, a compensating plunger also arranged in said pump chamber, and means for maintaining a yielding pressure upon said compensating plunger to normally urge the same to its innermost position.

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

NORMAN McCARTY. [L. S.]

Witnesses:

ARTHUR M. HOOD,
THOMAS W. McMEANS.