E. E. SLICK.

PUMP.

APPLICATION FILED DEC. 22, 1906.

978,668.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

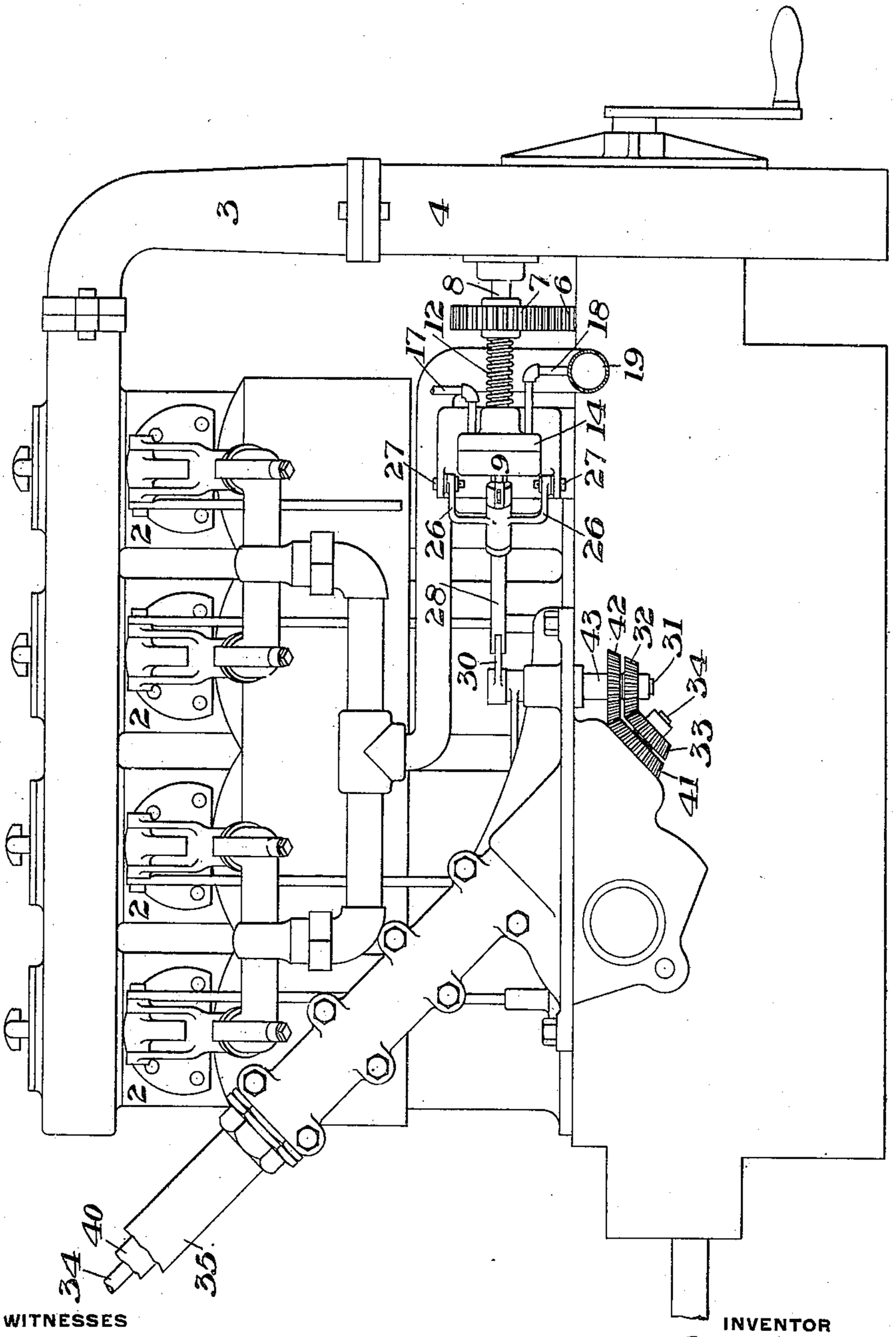

Fig. 1.

WITNESSES

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by Bakewell & Byrnes

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2 SHEETS—SHEET 2.

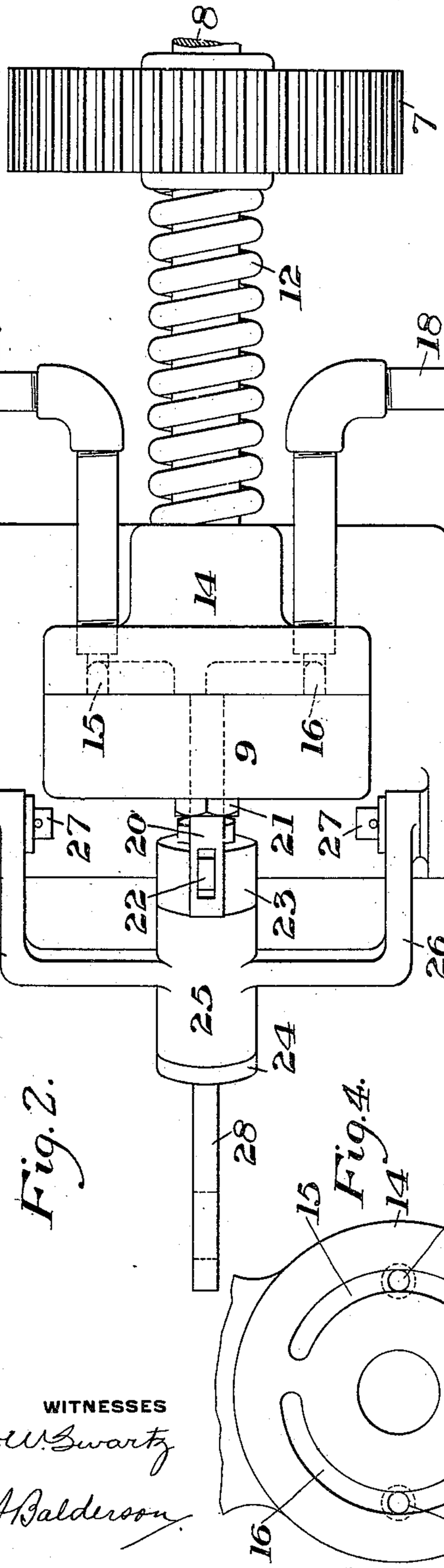

Fig. 2.

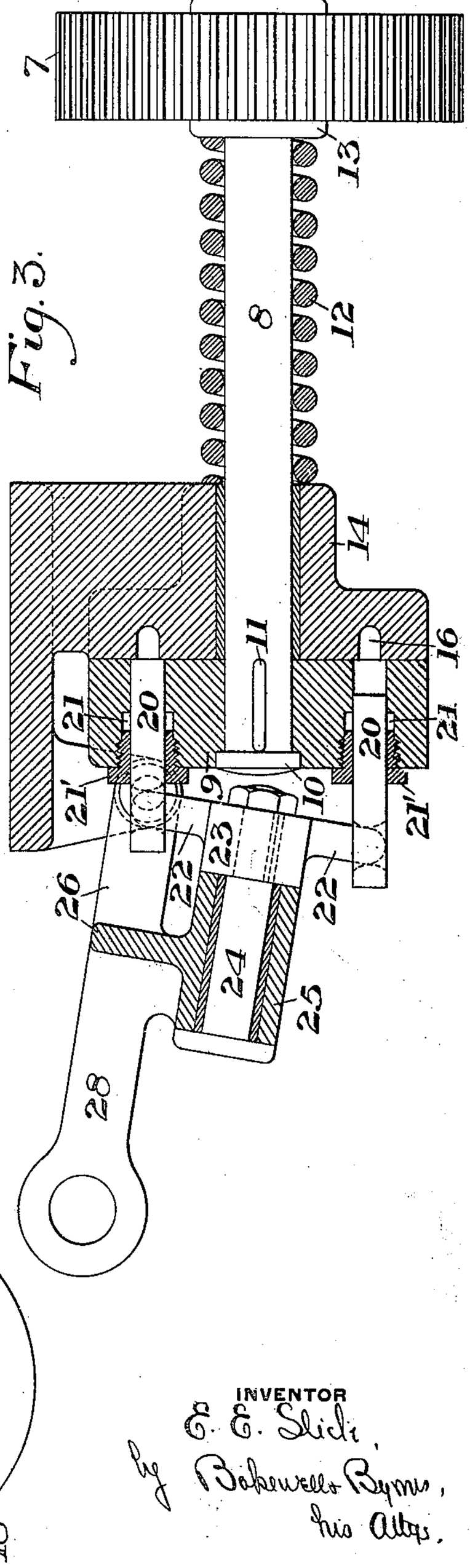

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

EDWIN E. SLICK, OF PITTSBURG, PENNSYLVANIA.

PUMP.

978,668. Specification of Letters Patent. Patented Dec. 13, 1910.

Application filed December 22, 1906. Serial No. 349,010.

To all whom it may concern:

Be it known that I, EDWIN E. SLICK, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Pump, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a portion of an automobile having my improved pump applied thereto and constituting a fuel feed device therefor; Fig. 2 is a side elevation of the pump and connections on a larger scale; Fig. 3 is a sectional plan view of the same; and Fig. 4 is a face view of the plate having a curved feed channel.

My invention has relation to pumps, and is designed to provide a pump by which a regulable and measured quantity of liquid may be supplied to any given point.

While my improved pump is applicable to a variety of purposes, it has been more especially designed for use in supplying the fuel to explosive engines such as those used on automobiles, and I have shown and will describe the application of my invention thereto.

Heretofore on automobiles and other locations where explosive engines are used, the fuel has been fed by a carbureter device which depends upon the suction of the engine. It has also been proposed to use a positive feed on a stationary engine.

My invention is designed to overcome the difficulties of a suction carbureter feed, and provide for the measuring of the charge and the adjusting of the charge to different amounts during the running of the engine.

It is also preferably provided with a positive feed device whereby the measured amount of fuel is forced into the inlet pipe in the engine.

It also relates in its preferred form as applied to automobiles, to means under the control of the driver, and preferably on the steering stem or wheel, for varying the charges, as desired, during the running of the engine.

In the drawings, I show an automobile engine having four cylinders 2 which are shown as cooled by air jackets through an air supply pipe 3 leading from a blower or fan in case 4.

7 is a toothed wheel, which is driven by a gear 6 on the valve operating shaft of the engine. The wheel 7 is mounted on the shaft 8, which carries a disk 9. Provision is made for rotating the disk 9 and also allowing a slight endwise movement thereof. In the form shown, this is accomplished by a collar 10 on the shaft 8 which bears upon the disk 9, a splined connection 11 being provided between the shaft and disk. A spiral spring 12 acting on collar 13 tends to draw the disk 9 against the feed plate 14. The inner face of this feed plate is provided with two curved channels or grooves 15 and 16. The arc-shaped channel 15 is the inlet feed, and is supplied with gasolene through pipe 17 leading from the gasolene supply pipe. The arc-shaped recess 16 connects by pipe 18 with the air inlet pipe 19 which leads to the inlet valves.

The disk 9 is provided with plungers 20, of which I have shown two, though any desirable number may be used according to proportioning the gearing, of the number of cylinders, etc. These plungers are reciprocated within their stuffing boxes 21 and glands 21′ by lugs or pins 22 projecting from a rotating head 23 secured to a rotating stub shaft 24. The shaft 24 is carried in a bearing 25 having forked arms 26 pivotally mounted on pins 27 mounted in brackets projecting from the feed plate 14. The axis of these pins intersects the axis of the pin 20 at one point in the stroke, and at this part of the stroke, the throw is so arranged that the plunger is at the end of its bore, as shown in the top portion of Fig. 4. As the pin 24 extends at an angle to the shaft 8, a reciprocating movement will thus be imparted to the plunger 20 during the rotation of disk 9. An arm 28 extends from the forks 26, and is pivotally connected with a rock arm 30 on a vertical shaft 31 having a bevel gear 32 intermeshing with bevel gear 33 secured to stem on shaft 34, mounted within the hollow steering post 35. The upper end of the shaft 34 may be provided with the ordinary operating handle or control lever. By shifting the lever 36, the arm 28 will be tilted so as to change the angular relation between the shafts 24 and 8, thus correspondingly changing the stroke of the plungers, and varying the amount of gasolene allowed to enter the measuring chamber.

40 is a hollow shaft or tube which extends within the hollow steering post 35 around the shaft 34, and which may be provided at its upper end with the usual operating handle. This shaft is connected with the

bevel gears 41 and 42 to the rock shaft 43, which is connected to the timing mechanism in the ordinary manner.

In the operation of an automobile provided with my improved system, the gasolene is fed either by gravity, by forced feeding, or other desirable system, to the arc-shaped feed channel 15. From this channel it is fed successively into the plunger chambers, the amount or volume of the fuel being measured by the extent of throw of the plunger which may be regulated during the operation of the engine by shifting the position of the lever 36 on the steering wheel. After the gasolene or other fuel enters each fuel chamber, it is forced out of the plunger while passing over the arc-shaped outlet groove 16, and then flows through pipe 18 into the air inlet feed. Special devices may be employed if desired, in order to spray or diffuse the gasolene either in the form of liquid or vapor in the air channel.

The advantages of my invention result from measuring of the amount of fuel fed to the cylinders, and the capability of changing the measured volume or amount while the engine is in operation. In this manner; the successive charges of fuel may each be measured to exactly the amount required, the charge then being dropped into the air channel. The plunger feed device will also be of advantage in feeding oil to bearings on cylinders; since no valves are used, and the oil is not liable to clog it in passing through inlet valves; and in my claims, I do not wish to restrict myself to the apparatus, as used for feeding the fuel alone.

The device for changing the stroke of the pistons may be varied and many other changes may be made in the form and arrangement of the parts and the connections, without departing from the spirit and scope of my invention.

I claim:—

1. In a pump, a rotary carrier having an eccentrically positioned pump element, another member positioned angularly with respect to said carrier and having a coöperating pump element, and connections arranged to change the angularity of the angularly positioned element about an axis which is eccentric to the axis of the rotary carrier; substantially as described.

2. In a pump, a rotary carrier having a plurality of eccentrically positioned pump elements therein, another member positioned angularly with respect to said carrier and having a plurality of pump elements coöperating with the pump elements of the carrier, and connections for changing the angularity of the angularly positioned element about an axis which is eccentric to the axis of the rotary carrier, together with an outlet discharge into which the pump elements are arranged to effect successive alternate discharges and an inlet passage with which the pump elements are successively alternately connected; substantially as described.

3. In pump mechanism, a rotary member having a fuel measuring chamber therein, a piston or plunger working in said chamber, a rotary carrier for the plunger having its axis at an angle to the axis of the member, a relatively fixed but adjustable support for said carrier, said support having its center of adjusting movement in a line which is eccentric to and does not intersect the axis of the rotary member; substantially as described.

4. In pump mechanism, a rotary member having a plurality of fuel measuring chambers therein, plungers or pistons working in said chambers and rotating with said members, a carrier for the plungers or pistons having its axis of rotation at an angle to the axis of rotation of the rotary members, and a pivoted yoke or frame in which the carrier is mounted, the pivotal point of said frame being in a line which is intersected by the longitudinal axis of the plungers at one point in the revolution of each plunger; substantially as described.

In testimony whereof, I have hereunto set my hand.

EDWIN E. SLICK.

Witnesses:
H. M. Corwin,
R. D. Little.