

J. W. PACKARD.
HYDROCARBON MOTOR.
APPLICATION FILED MAY 8, 1900.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

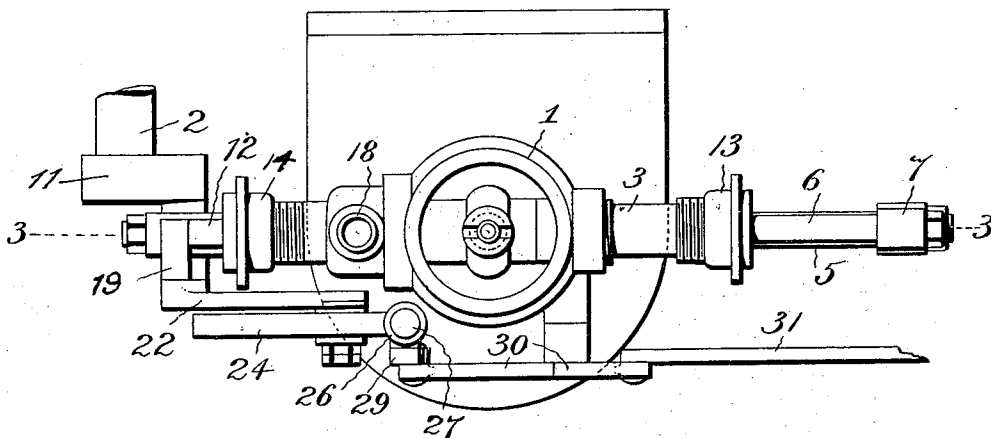
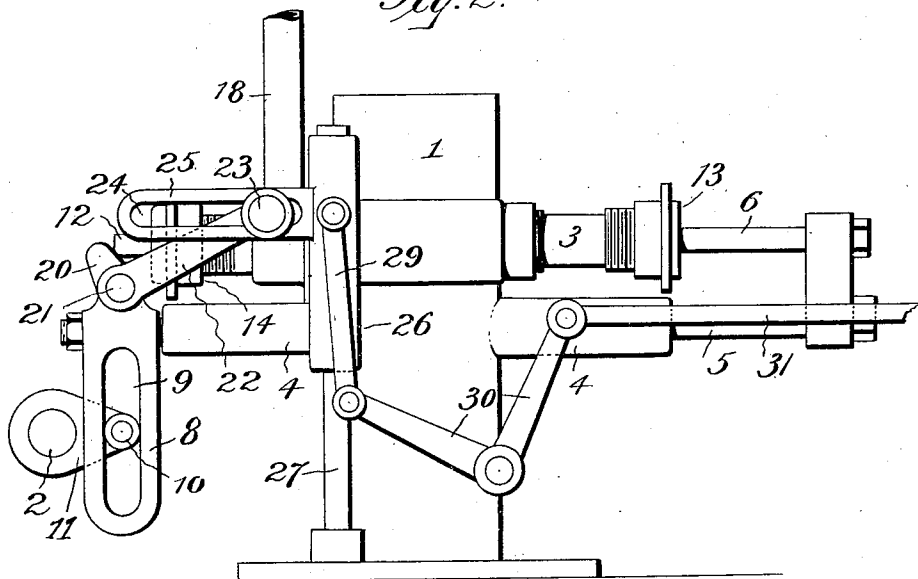


Fig. 2.



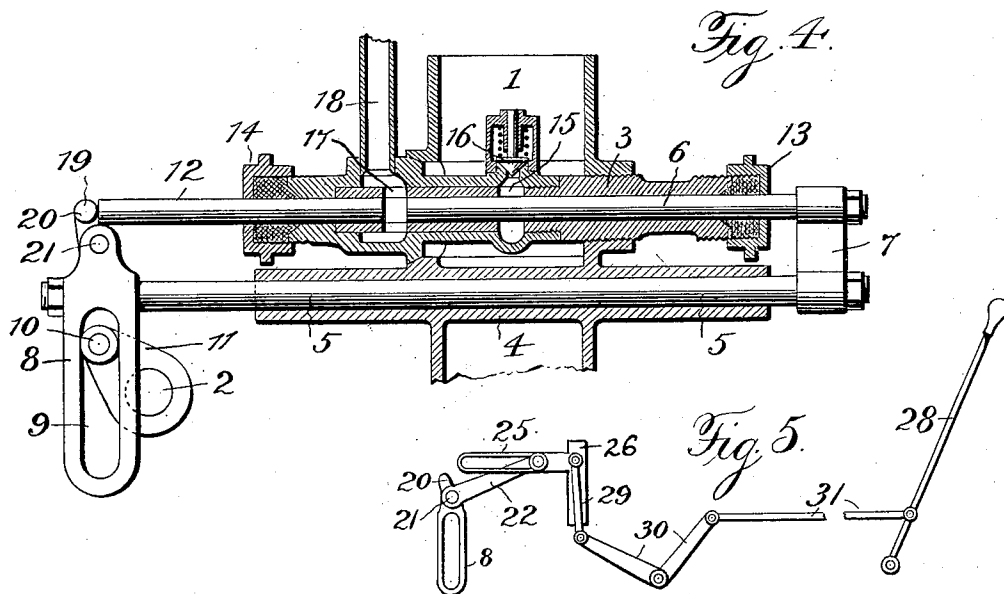
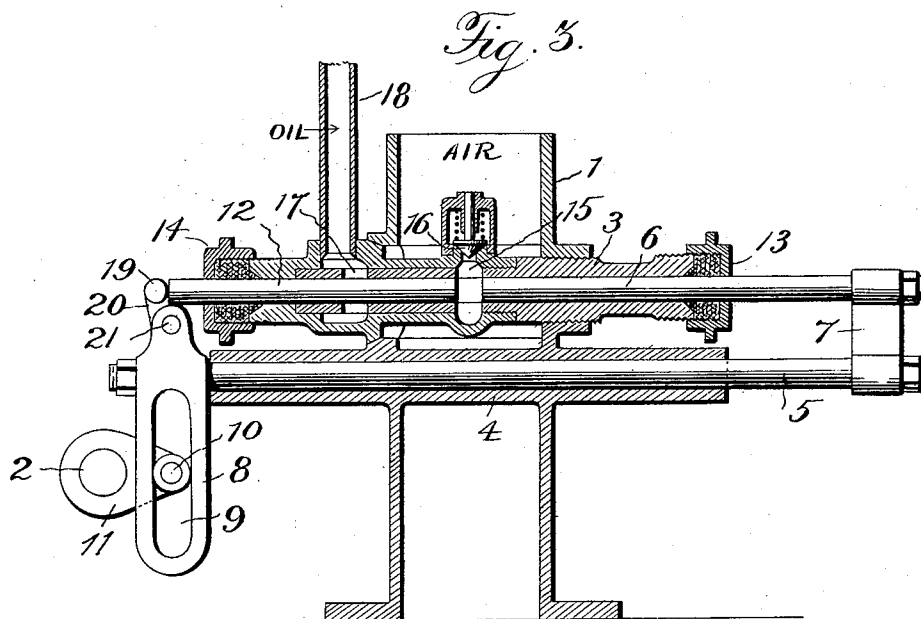
Witnesses:
Jas. Hutchingson
Arthur L. Bryant

Inventor.
J. W. Packard
By Watson & Watson
Attorneys

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2 SHEETS—SHEET 2.



Witnesses:
James Hutchinson
Arthur L. Bregant

Inventor.
J. W. Packard
By Watson & Watson
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES W. PACKARD, OF WARREN, OHIO, ASSIGNOR TO PACKARD MOTOR CAR COMPANY, OF WARREN, OHIO, A CORPORATION OF WEST VIRGINIA.

HYDROCARBON-MOTOR.

SPECIFICATION forming part of Letters Patent No. 722,431, dated March 10, 1903.

Application filed May 8, 1900. Serial No. 15,878. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. PACKARD, a citizen of the United States, residing at Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Hydrocarbon - Motors, of which the following is a specification.

The object of the present invention is to provide a feeding device for hydrocarbon-engines adapted to transfer a definite charge of hydrocarbon to the mixer for each explosion and to provide means for varying the charge according to the work required to be done.

The present improvement is designed especially for use in hydrocarbon-engines for motor-vehicles, and the device is adapted to be controlled by a lever conveniently situated near the seat of the operator of the vehicle.

The details of the invention will now be described, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of the mixer and hydrocarbon-feeding devices. Fig. 2 is a side view of the same. Figs. 3 and 4 are central sectional views on the line 3 3 of Fig. 1, illustrating the parts in different positions; and Fig. 5 shows the connections between the regulating device and its operating-lever.

Referring to the drawings, 1 indicates the mixer-tube, through which air and oil pass to the cylinder of the engine, and 2 is a shaft driven constantly from the crank-shaft of the engine. Transversely arranged in the air-tube 1 is a pump-barrel 3, and below said pump-barrel is a second transverse tube 4. A connecting-rod 5 reciprocates in the tube 4, and the pump-piston 6 is reciprocated in the barrel 3 by means of a head 7, which connects it with the rod 5. The rod 5 is reciprocated by means of an arm 8, having a slot 9, in which works a crank-pin 10, carried by a crank 11 on the shaft 2. In line with the piston-rod 6 is a plunger 12 of the same diameter. The piston-rod passes through a stuffing-box 13 at one end of the barrel 3, and the plunger 12 passes through a stuffing-box 14 at the other end thereof. At the middle of the barrel is a lateral opening 15, normally closed by a spring-valve 16. The end of the

piston-rod moves from a position to the right 50 of the opening 15, as shown in Fig. 3, to a position at the left of a second transverse opening 17, which communicates with an oil-supply pipe 18.

The operation of the feed-pump is as follows: Assuming that the piston and plunger are in the positions shown in Fig. 4, the space between them will be immediately filled by gasoline or other fluid fuel from the supply-pipe 18. The turning of the shaft 2 now carries the piston to the right, and an adjustable abutment 19 upon the arm 8 carries the plunger to the right also, preserving the same distance between the adjacent ends of the plunger and piston until the piston has reached the end of its stroke and the open space between said plunger and piston registers with the opening 15. The piston now starts on its return stroke, and the plunger is held stationary by friction, the material in the stuffing-box being clamped tightly about it for this purpose. During the first part of the return stroke of the piston the oil between the piston and plunger is forcibly ejected and an equal amount of oil passes from the space 15 through the valve 16 into the air-chamber. The piston then moves the plunger over until it again reaches the position shown in Fig. 2. The piston then starts back, and the plunger remains stationary for a few moments, during which time the oil is positively drawn into the space between the piston and plunger. The abutment 19 then engages the plunger, and the piston and plunger move again to register with the space 15 and valve 16. In this manner a positive feed for the gasoline or other fluid is effected.

It is necessary to vary the charges of hydrocarbon according to the work to be performed by a motor-vehicle. Thus in running upon a level small charges will be sufficient, while in climbing a hill very much more hydrocarbon will be necessary. The charges are varied as follows: The abutment 19 is in the form of a crank-pin carried by a crank or arm 20 on a rock-shaft 21. A second arm 22 on said shaft is provided with a pin 23, which extends through a slot 24 in a horizontal arm

25, carried by a vertical slide 26, said slide being in the form of a cylinder, through which passes a stationary vertical post 27.

The slot 24 is equal to or somewhat greater in length than the stroke of the pump-piston, and when the slotted arm is stationary the abutment 19 will bear the same relation to the slotted arm 8 throughout the stroke of the pump. By rocking the arm 20 the distance between the abutment 19 and the end of the piston 6 may be varied and the opening between the piston and plunger likewise varied. Therefore by adjusting the slide 26 the chamber between the piston and the plunger may be adjusted or varied to carry different quantities of hydrocarbon. The hydrocarbon, however, in all instances is positively drawn into said chamber and positively ejected therefrom.

The slide 26 may be operated in any suitable manner from the front of the vehicle. As shown, it is connected with a hand-lever 28 by means of a link 29, elbow-lever 30, and link 31.

It will be evident that numerous changes in the details of construction and arrangement of parts may be made without departing from the spirit and scope of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In an engine of the class described, in combination, the pump-barrel having lateral inlet and discharge openings, a piston reciprocating in said barrel, a plunger in said barrel arranged to be moved in one direction by the piston, an adjustable abutment arranged to move said plunger in the opposite direc-

tion, connections between said piston and said abutment whereby they are moved simultaneously, an operating-lever, and connections between said lever and said abutment whereby the abutment may be adjusted relatively to the piston while the engine is running.

2. In an engine of the class described, in combination, an air-inlet pipe, a barrel arranged transversely therein, an oil-outlet, a valve therefor arranged within the air-pipe, an oil-inlet to the barrel arranged outside of the air-pipe, a piston and plunger reciprocating in said barrel, said plunger having a small amount of lost motion, means for reciprocating the piston, an adjustable abutment reciprocating with the piston and operating on the plunger, and means for adjusting the abutment when the engine is running.

3. In an engine of the class described, in combination, the barrel having inlet and discharge openings, the piston and plunger operating in said barrel, the rod 5 connected with the piston, the abutment adjustably mounted on said rod and coöperating with the plunger, the arm connected with said abutment and provided with a pin, the horizontal slotted arm in which said pin travels, the hand-lever, and connections whereby said slotted arm is adjusted vertically by said hand-lever to vary the position of said abutment relatively to the piston.

In testimony whereof I affix my signature in presence of two witnesses.

JAS. W. PACKARD.

Witnesses:

ROBT. E. GORTON,
M. S. ANDREWS.