

No. 756,011.

PATENTED MAR. 29, 1904.

J. L. FITZ GERALD.
GASOLENE MOTOR.

APPLICATION FILED JUNE 1, 1903.

NO MODEL.

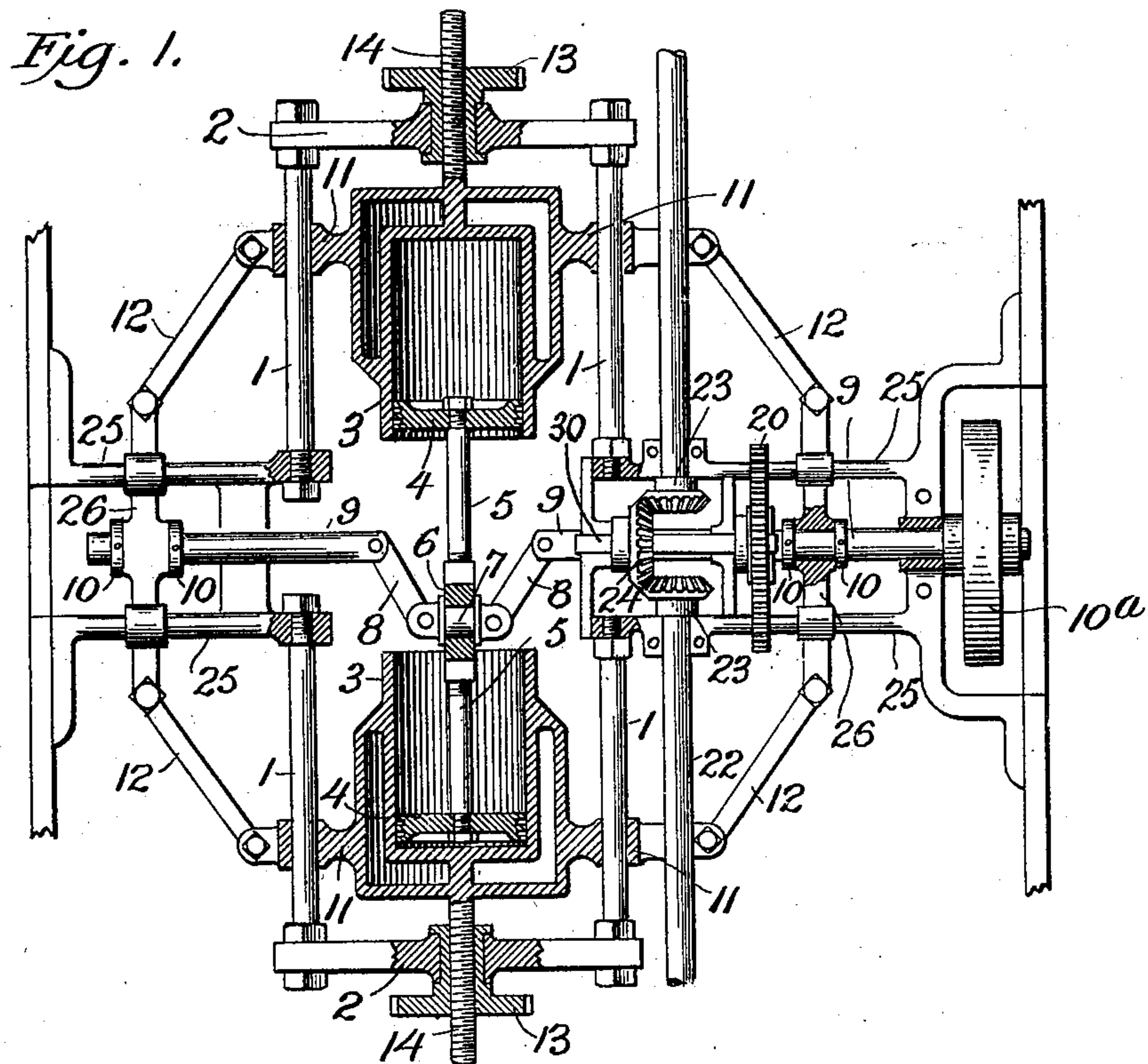


Fig. 2.

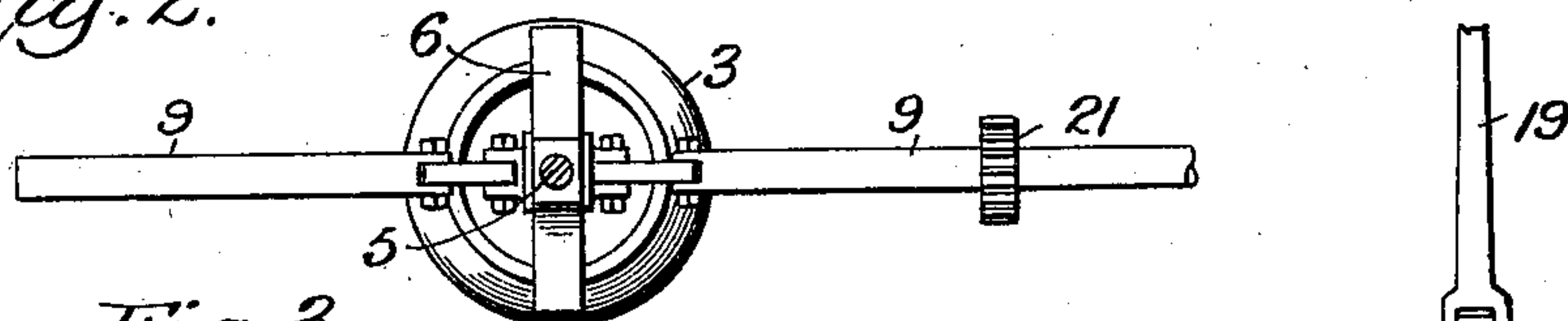
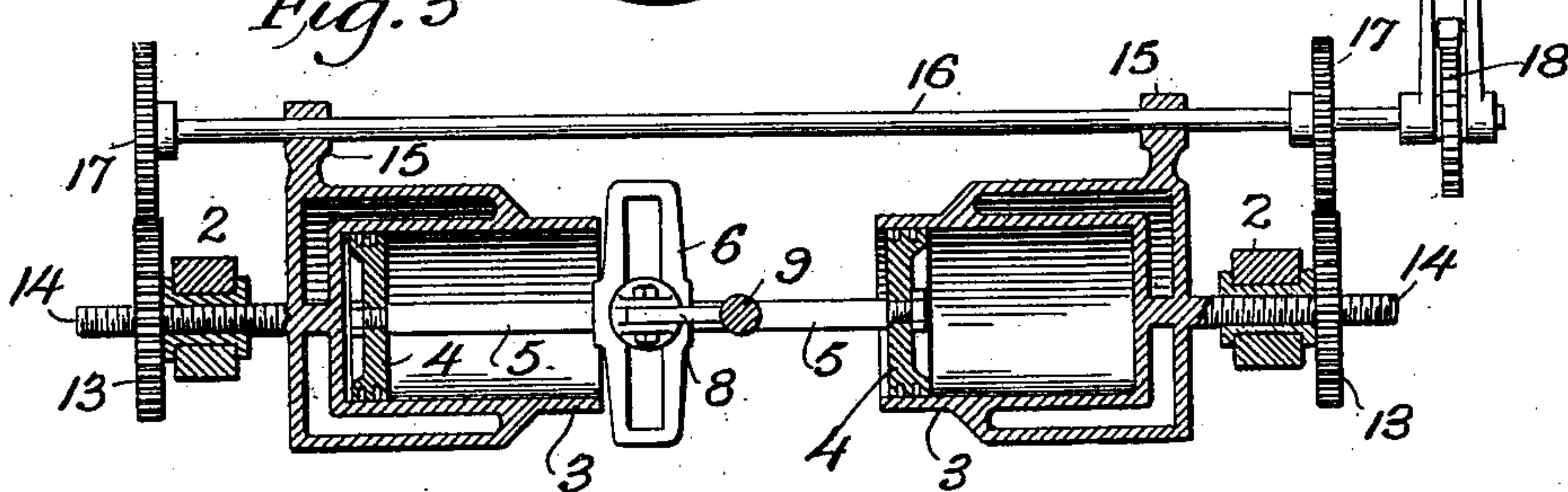


Fig. 3.



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JAMES L. FITZ GERALD, OF NEWPORT, RHODE ISLAND.

GASOLENE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 756,011, dated March 29, 1904.

Application filed June 1, 1903. Serial No. 159,447. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. FITZ GERALD, a citizen of the United States of America, and a resident of Newport, in the county of Newport and State of Rhode Island, have invented certain new and useful Improvements in Gasoline-Motors, of which the following is a specification.

My present invention relates to a hydrocarbon or other explosive motor adapted especially for use with automobiles and other automobiles.

The object is to make an engine that will be more elastic in use, can be more easily started, and run more economically than has heretofore been possible.

It consists, essentially, in adjustable cylinders that may be changed in position relatively to each other so as to regulate the length of the stroke, and also it comprises numerous details in the construction, arrangement, and combination of parts, substantially as will be hereinafter more fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a sectional plan view of my improved gas-engine. Fig. 2 is a detail end view of one of the cylinders, its piston, piston-rod, a drive-shaft, and other parts. Fig. 3 is a longitudinal sectional view through the cylinders and shows the devices for adjusting them relatively to each other.

Similar numerals of reference denote like parts in the different figures.

In order to support the cylinders, I provide a suitable framework, which may be constructed in any desired manner, the form given in the drawings being shown simply by way of example. In this specimen framework, 1 1 denote parallel guide-rods connected at the ends by cross-rods 2. 3 3 designate the cylinders wherein the explosions occur, said cylinders being of any suitable type or construction and being open at one end and also provided with the customary water-jacket. Furthermore, the cylinders are provided with the lateral lugs or ears 11, which are perforated and slide on the parallel guide-rods 1. Within the cylinders 3 are the pistons 4, having the piston-rods 5, which are connected to the cen-

tral yoke 6, in which is the crank-pin 7, belonging to the crank-shaft 9. The main supporting-frame is also provided with the parallel guide-rods 25 25, placed at right angles to the guide-rods 1, there being one pair of guide-rods 25 secured to one guide-rod 1 and another pair of guide-rods 25 secured to the other guide-rod 1.

26 26 indicate sliding bars through which the guide-rods 25 pass, so that these bars 26 are thus mounted to slide on the rods 25. Cross-bars 26 are connected by links 12, of which there are four, with the lugs 11 on the cylinders 3, so that as the cylinders are adjusted the links 12 will operate to transmit motion to the cross-bars 26 and slide the latter more or less upon the guide-rods 25. The crank-shaft 9 is provided near each end with collars 10, fastened rigidly thereon at opposite sides of the cross-bars 26, said crank-shaft 9 passing centrally through said cross-bars. The crank-shaft 9 is provided with inserted links 8, pivoted to the crank-pin 7 and to the sections of the crank-shaft, so that in this way said shaft 9 lengthens or shortens to correspond with the adjustment of the cylinders.

The cylinders 3 are provided with screw-threaded rods or studs 14, affixed rigidly to the ends of the cylinders and passing through the cross-pieces 2 2 of the main frame, journals being provided in said cross-pieces and the screw-studs being provided with nuts 13 by the adjustment of which the cylinders may be caused to slide toward or away from each other on the guide-rods 1. In order to effectively provide this adjustment, I form lugs 15 on the cylinders 3, near the ends thereof, in which rod 16 is supported revolvably. Rod 16 carries pinions 17 17 near each end, which engage the teeth of gear wheels or pinions 13, whose hubs or central portions form the nuts that engage the screw-rods 14. A lever 19, projecting into convenient position to be grasped by the motorman operates conjunctively with a pawl and ratchet 18 to rotate the shaft 16, and thereby revolve the gears 13 and the nuts on the screws 14 and move the cylinders 3 3 back and forth nearer to or farther away from each other, the result of which

change in the relative position will be to change the length of the stroke. A shortening of the stroke can be made in starting during easy running and on downgrades, and thus only a
 5 small charge will be admitted, and as the area of the explosion-chamber before compression is reduced the engine will be worked more economically. When more power is required, as in hill-climbing, the stroke will be length-
 10 ened and the piston will move farther in the cylinder, thereby admitting a greater volume of gas, so that consequently the compression may be in proportion to the increased charge.

On a short shaft 30 is a bevel-pinion 24, that engages with the bevel-pinions 23 23 on
 15 the shaft 22, running parallel to the axis of the cylinders 3 3, said shaft 22 being the axle of the carriage. The shaft 30 is parallel to the crank-shaft 9. On shaft 30 is also a gear-
 20 wheel 20, that engages a pinion 21 on the crank-shaft 9. In this way motion is communicated from shaft 9 through gears 21 and 20 to shaft 30 and then through the miter-gears 24 and 23 to axle 22. Furthermore, on the
 25 shaft 9 is a fly-wheel 10^a of any suitable form.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a gas or other explosive motor, a pair
 30 of cylinders whose members are adjustable toward or away from each other to shorten or lengthen the stroke of the piston, in combination with a crank-shaft and means for lengthening or shortening the throw of the
 35 crank.

2. In a gas or other explosive engine, explosion-cylinders, pistons therein having piston-
 40 rods, a common crank-shaft, means for adjusting the cylinders toward or away from each other to regulate the length of the stroke of the piston, and means for lengthening or shortening the throw of the crank in correspondence with the adjustment of the cylin-
 45 ders.

3. In a gas or other explosive motor, cyl-
 45 inders arranged so as to be adjusted toward or away from each other, pistons in the cylinders, which pistons operate on a common crank-shaft provided with means for lengthen-
 50 ing or shortening the throw of the crank cor-

respondingly with the adjustment of the cylinders.

4. In a gas or other explosive motor, explosion-cylinders that are adjustable in relation to each other, pistons in said cylinders, a
 55 common crank-shaft to which the pistons apply their power, means for lengthening or shortening the throw of the crank, and means for adjusting the cylinders toward or away from each other consisting essentially of
 60 screw-rods on the cylinders and devices engaging said rods.

5. In a gas or other explosive motor, cylinders arranged to be adjusted toward or away from each other, in combination with pistons
 65 having rods provided with a transverse slotted yoke, and a crank-shaft whose pin slides in said yoke, said shaft consisting of sections whereby the throw of the crank is lengthened or shortened correspondingly with the adjust-
 70 ment of the cylinders.

6. In a gas or other explosive motor, cylinders arranged to be adjusted toward or away from each other, pistons in said cylinders hav-
 75 ing piston-rods provided with a slotted yoke, a sectional crank-shaft whose pin slides in said yoke, which shaft is lengthened or shortened to control the throw of the crank in correspondence with the adjustment of the cylinders, cross-heads attached to the ends of the
 80 crank-shaft and links connecting said cross-heads with the cylinders.

7. In a gas or other explosive motor, the combination of the adjustable cylinders, pistons therein having rods connected together
 85 by a slotted transverse yoke, a crank-shaft consisting of inter-pivoted sections and having a pin that slides in said yoke, transverse bars attached to the ends of the crank-shaft, and pivoted links connecting the ends of said bars
 90 to the cylinders, so that as the cylinders are adjusted the throw of the crank will be likewise regulated.

Signed at Newport, Rhode Island, this 7th day of May, 1903.

JAMES L. FITZ GERALD.

Witnesses:

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 ROBERT E. GORDON.