

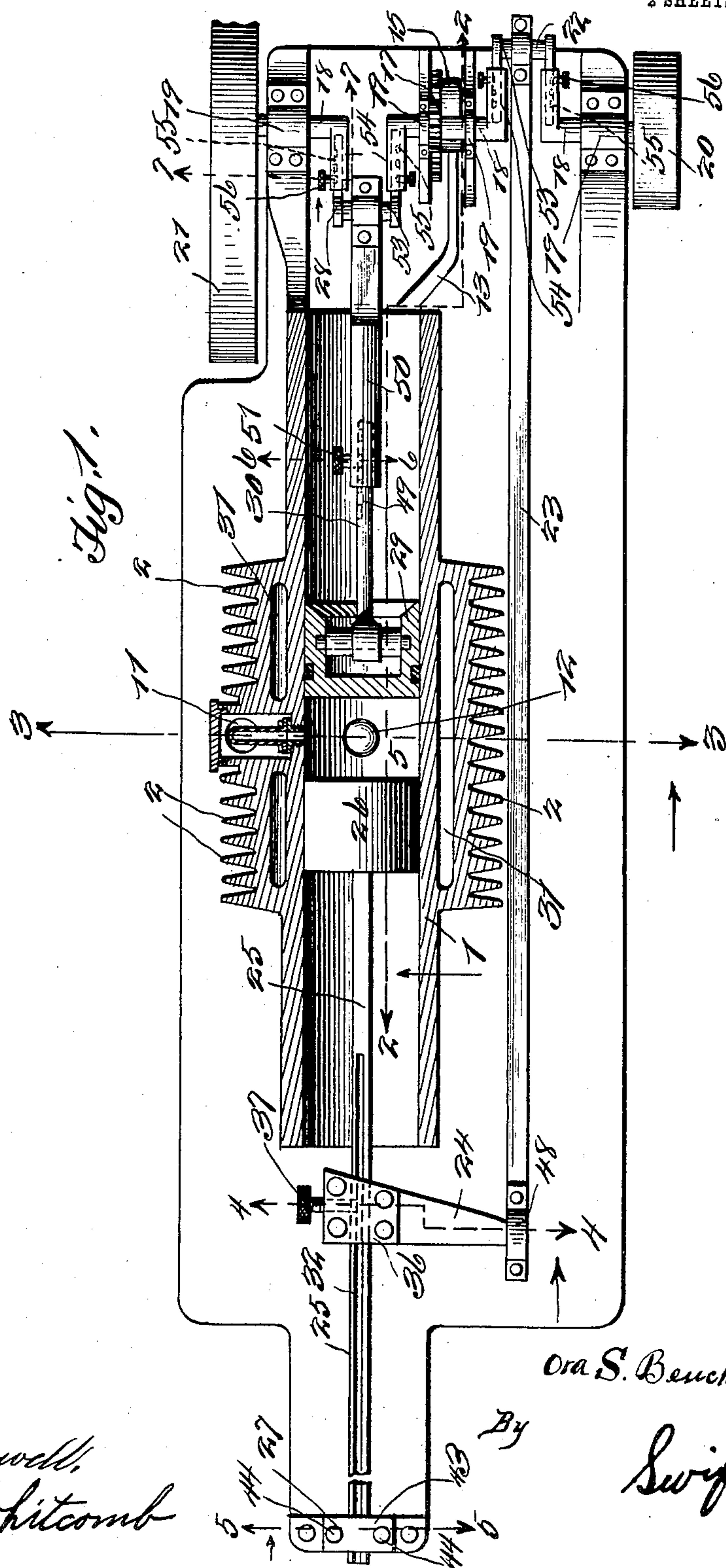
No. 862,603.

PATENTED AUG. 6, 1907.

O. S. BENCKENDORF.
GASOLINE ENGINE.

APPLICATION FILED MAR. 10, 1906.

2 SHEETS—SHEET 1.



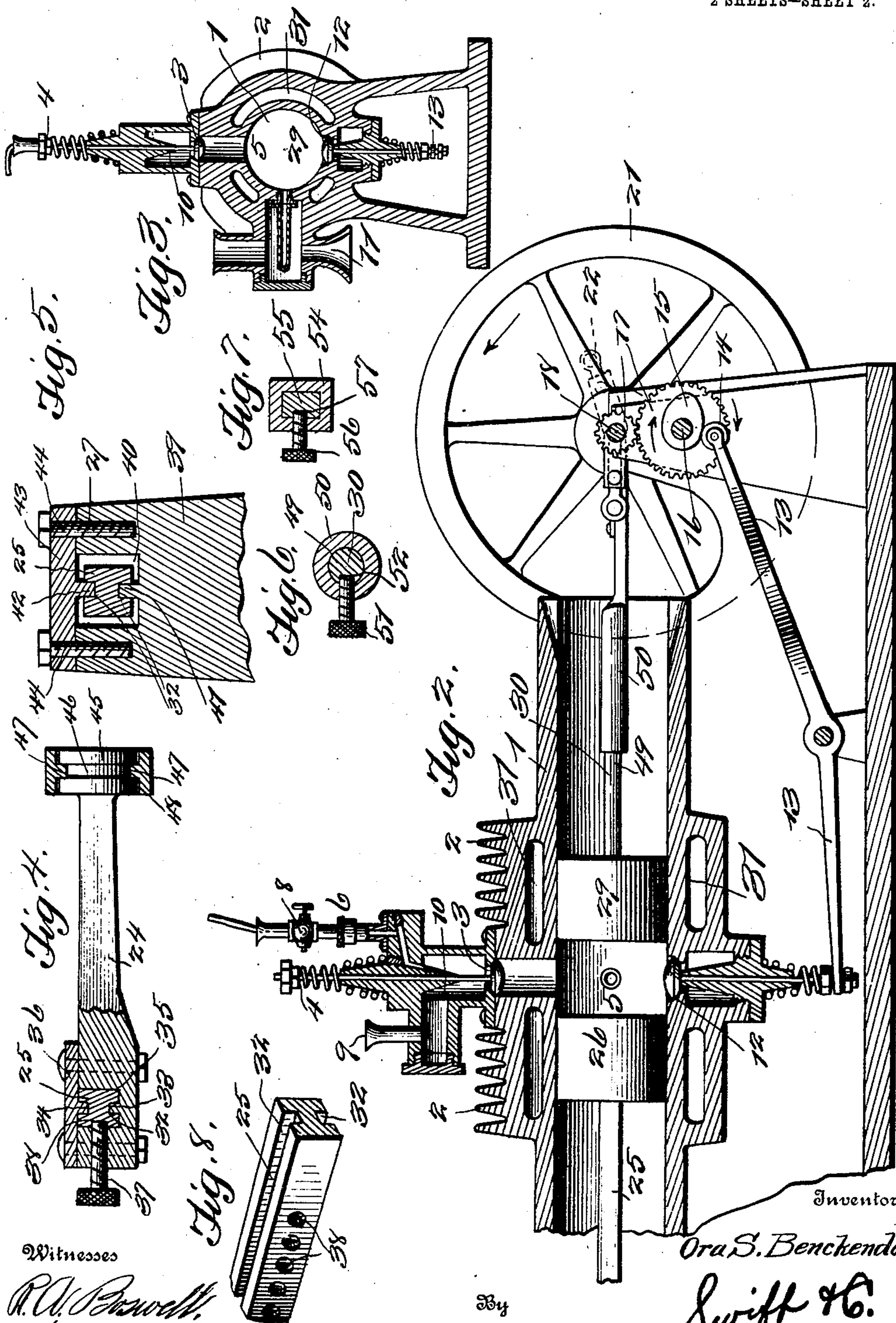
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2 SHEETS—SHEET 2.



Witnesses

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GASOLENE-ENGINE.

No. 862,603.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed March 10, 1906. Serial No. 305,237.

To all whom it may concern:

Be it known that I, ORA S. BENCKENDORF, a citizen of the United States, residing at Streator, in the county of LaSalle and State of Illinois, have invented a new and useful Gasolene-Engine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention has relation to certain new and useful improvements in gasolene engines and more particularly the invention relates to a type that is hereinafter described and claimed.

15 The most essential object of the invention is to provide a device of this character whereby the explosion of gasolene will thrust the pistons from the center of the cylinder; the pistons are driven from one another with such force as to cause them to return to the center to receive another charge.

20 This invention comprises further objects and combinations of elements which will be hereinafter more fully described and shown in the accompanying drawings and the novel features thereof will be pointed out by the appended claims.

25 To obtain a full and correct understanding of the details of construction and combinations of features, elements and advantages reference is to be had to the hereinafter set forth description and the accompanying drawings in connection therewith wherein:—

30 Figure 1 is a horizontal longitudinal sectional view of the invention. Fig. 2 is a sectional view on line 2—2 of Fig. 1. Fig. 3 is a cross section on line 3—3 of Fig. 1. Fig. 4 is a sectional view on line 4—4 of Fig. 1. Fig. 5 is a sectional view on line 5—5 of Fig. 1. Fig. 6 is a sectional view on line 6—6 of Fig. 1. Fig. 7 is a sectional view on line 7—7 of Fig. 1. Fig. 8 is a detail view of the piston rod 25.

35 Making renewed reference to the accompanying drawings wherein similar reference characters indicate the corresponding parts in the several illustrations by figures, 1 designates the cylinder of the engine which is provided with ribs or wings 2 which are of considerable depth for the purpose of strengthening the cylinder.

40 The cylinder is provided with a charge inlet valve 3 which is spring-held and adjustable, as at 4, for the purpose of regulating the charge into the combustion chamber 5. The gasolene enters at 6 and is regulated by a faucet or valve 8. Air enters, as at 9, by the suction of the pistons, atomizing the gasolene as it drops into the air chamber 10. A spark plug or tube igniter may be used but in the present instance the tube igniter is employed which is adapted to be heated by means of a gasolene burner beneath the bell mouth 11 which burner is not shown. An exhaust valve 12 is provided which is operated by a suitable oscil-

lating bar 13 one end of which is connected to the exhaust valve and the other end is provided with a friction roller 14 adapted to cooperate with a cam 15 which is mounted upon the shaft 16 which has suitable gear connection 17 with the double crank shaft 18. This double crank shaft is mounted in suitable bearings or journal boxes 19 and is provided with the usual pulley 20 and fly wheel 21. The crank 22 of the shaft 18 is connected to a pitman rod 23 which in turn is pivoted to a bracket 24 carried by the piston rod 25 which is connected to a piston 26; this piston rod reciprocates through a bearing 27, as shown in the drawings. The crank 28 of the shaft 18 is connected directly with the piston 29 by means of a pitman rod 30 as clearly shown in the accompanying drawings. The cylinder 1 is surrounded by a water cooling jacket 31 or space to prevent the cylinder from becoming too hot.

45 The gasolene finds its way to the combustion chamber in the form of gas where it is ignited by the spark plug or tube igniter, that is when the pistons are adjacent the center of the cylinder and after the combustion has taken place, the pistons are forced in opposite direction from the center of the cylinder thereby rotating the double crank shaft from which power may be transmitted to any suitable location. The compression between the pistons is sufficient to thrust the said pistons from the center in opposite directions and back in position to receive the next charge.

50 The piston rod 25 is made adjustable with relation to the bracket 24 by forming a rectangular groove 32 in the upper and lower faces of the piston rod, as shown in Fig. 8, to receive the rectangular tongues 33 and 34; the tongue 33 being formed in the lower portion of a recess 35, of the bracket 24, and the tongue 34 being formed upon the under face of a securing plate 36, which plate is for the purpose of preventing the displacement of the piston rod, as will be understood from the drawings. To securely hold the bracket in adjusted position upon the piston rod, a thumb screw 37 is provided, for engagement with one or another of the recesses 38, formed in one side of the said piston rod, as shown in Fig. 4.

55 The bearing 27, through which the piston rod 24 is adapted to reciprocate, comprises a solid casting 39, which is secured to the base of the engine, and is provided with a rectangular recess 40 of greater diameter than the thickness of the said piston rod, so as to only allow the rectangular groove 32 of the piston rod to receive the tongues 41 and 42, so as to provide a smooth and easy bearing therefor; the tongue 41 is formed in the lower portion of the recess 40, and the tongue 42 is formed with a securing plate 43, as shown in Fig. 5; this securing plate is fastened to the casting 39 by means of bolts 44, and is for the purpose of preventing the displacement of the piston rod in its reciprocation.

The outer end of the bracket 24 is provided with a circular enlargement 45, having a rectangular groove 46 therein, to receive the tongue 47 in a circular bearing 48, at the end of the pitman rod 23, as shown in Fig. 4; 5 this circular bearing is formed of a semi-circular portion of the said pitman rod and a semi-circular cover.

The pitman 30 is adjustable, and comprises two sections 49 and 50, the section 49 telescopes within the section 50 and is held in adjusted position by means 10 of a thumb screw 51, which engages one or another of the recesses 52 which are formed in the section 49, as shown in Fig. 6.

The cranks 22 and 28 being adjustable, comprise the U-shaped members 53, the arms of which telescope 15 within the rectangular shaped arms 54, which project at right angles to the shaft 18, as shown clearly in Fig. 1 of the accompanying drawings; the said arms 55 of the U-shaped members, are held in adjusted position by means of thumb screws 56 which engage any one of the 20 recesses 57 formed in the said arms 55, as clearly shown in Fig. 7 of the drawings.

The adjustment of the piston rod with relation to the bracket 24, and the adjustments of the pitman rods, and the cranks of the shaft 18, are for the purpose of 25 compensating for a greater throw of the cranks 22 and 28, that is, a throw of the said cranks of greater diameter than that shown in the accompanying drawings, as will be readily understood.

Having thus fully described the invention, what is 30 claimed as new and useful, by the protection of Letters Patent, is:—

1. In an explosive engine, a cylinder, a pair of pistons, mounted therein, a double crank shaft having adjustable

cranks one of said adjustable cranks having an adjustable pitman rod connection with one of said pistons, a piston 35 rod having rectangular grooves connected to the other piston, a bearing to receive said piston rod, a bracket adjustably carried by said piston rod, and a pitman rod connecting said bracket with the other adjustable crank of the double crank shaft, substantially as described. 40

2. In an explosive engine, a cylinder, a pair of pistons, mounted therein, a double crank shaft having adjustable cranks one of said adjustable cranks having an adjustable pitman rod connection with one of said pistons, a piston 45 rod having rectangular grooves connected to the other piston, a bearing to receive said piston rod, a bracket adjustably carried by said piston rod, containing a recess therein, said recess having a tongue to enter one of said grooves, a plate carried by the bracket, said plate having a tongue to enter the other groove, and a screw carried by the bracket, 50 said piston rod having recesses to receive said screw, and a pitman rod connecting said bracket with the other adjustable crank of the double crank shaft, substantially as described.

3. In an explosive engine, a cylinder, a pair of pistons 55 mounted therein, a double crank shaft having adjustable cranks one of said adjustable cranks having an adjustable pitman rod connection with one of said pistons, a piston rod having rectangular grooves, connected to the other piston, a bearing to receive said piston rod, comprising a 60 standard, a recess therein, having a tongue to enter one of said grooves, a plate bolted upon said standard, said plate having a tongue to enter the other groove to prevent displacement of the piston rod, a bracket adjustably carried by the said piston rod, and a pitman rod connecting said 65 bracket with the other adjustable crank of the double crank shaft, substantially as described.

In testimony whereof I have hereto affixed my signature, in the presence of two witnesses.

ORA S. BENCKENDORF.

Witnesses:

FRED W. BENCKENDORF,
WILFRED SEGUIN.