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Complete Specification Left, 19th Mar., 1891—Accepted, 25th Apr., 1891

PROVISIONAL SPECIFICATION.

Improvements in Gas or other Motive Power Engines.

I, GEORGE ROBSON, of 13, Shakespeare Terrace, Sunderland, in the County of Durham, Engineer and Iron Merchant, do hereby declare the nature of this invention to be as follows :—

My invention relates to improvements in gas or other motive power engines.

The novelty of my invention consists substantially of constructing the cylinder of the engine so as to contain two pistons of equal diameters but having unequal strokes and working in opposite directions but actuating the same crank shaft. One piston actuating a crank or cranks from what may for the purpose of this description be called the front end of the cylinder and the other piston actuating a crank or cranks through the back end of the cylinder.

The cranks of the two pistons may be set at any suitable angle to each other. By these arrangements and selecting a suitable point for the explosion of the gases between the pistons, I can get the crank or cranks at an angle to the line of travel of the pistons at the time of the explosion without any unnecessary cylinder space being used.

I would have it clearly understood that I do not limit myself to any particular method of introducing the gases into the cylinder nor do I confine myself to exerting power on one side of the pistons only nor of the method of compressing the gases nor to any particular arrangement of design as to the carrying out of my invention.

Dated this 16th day of June 1890.

GEORGE ROBSON.

COMPLETE SPECIFICATION.

Improvements in Gas or other Motive Power Engines.

I, GEORGE ROBSON, of 13, Shakespeare Terrace, Sunderland, in the County of Durham, Engineer and Iron Merchant, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

My invention relates to improvements in gas or other motor power engines.

The novelty of my invention consists substantially of constructing the cylinder of the engine so as to contain two pistons of equal diameter but having unequal strokes and working in opposite directions but actuating the same crank shaft.

I will describe my invention with reference to the accompanying drawings in which

Figure 1 shows a longitudinal section of a single cylindered engine with double pistons actuating the same crank shaft.

Figure 2 is a cross-section through the centre of the cylinder showing valves.

Figure 3 shows in section an arrangement of gas, igniting and admission valves and method of operating the ignition.

Figure 4 is a cross-section through the guide bars of the rear piston.

Like letters indicate like parts throughout the following description.

a is a motor cylinder with water jacket a^1 mounted on a bed plate a^2 in the usual way. a^3, a^4, are pistons of which a^3 operates through connecting rod a^5 crank a^6 on crankshaft a^7 while a^4 operates through two lateral connecting rods a^8 cranks a^9 of crankshaft a^7. Thus a^3 may have a 7-inch stroke and a^4 a

5-inch stroke making a combined stroke of 12 inches, both pistons operating one shaft. The cranks of the two pistons may be set at any suitable angle to each other. In Fig. 1 they are shown set at an angle of 215° but this angle may be reduced or the cranks may be set at an angle of 180° to one another. An effect of having a double-pistoned engine with one cylinder as described enables any single cylindered engine to have its cranks so set as that one thereof may always be off the dead centre.

b is the admission port to the cylinder and b^1 the exhaust. b^2 is the admission valve for gas and air or air alone, b^3 the gas admission valve and b^4 the valve for timing the ignitions. All these valves may be arranged and worked in any suitable manner or as indicated in the drawing wherein the gas and admission valves are operated by levers l worked from cams on side shaft s, the timing valve b^4 being operated by one of the side connecting rods a^8 of the rear-piston. In this arrangement, a small roller r fitted on the side of the rod a^8 is caused to strike a projection on the lever l^1 mounted as shown which thus operates the timing valve situated between the admission valve and the ignition tube. Through a boss in an extension of the rear piston the gudgeon g passes and in an extension of the cylinder for this purpose, the blocks g^1 work in lateral guides cast on the cylinder extension as shown in Fig. 4. The gudgeon ends take the ends of the lateral connecting rods.

When an explosive mixture is admitted to the cylinder and exploded, the pistons are driven outwards from each other; the momentum of the engine returning the pistons drives out the products of combustion through the exhaust port and carries the pistons outwards again when a fresh explosive charge may be drawn in and compressed between the pistons in their return stroke.

On ignition the motions are repeated.

Steadiness, regularity and a high speed may thus be obtained.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A double-pistoned single-cylindered engine wherein the pistons travel unequal distances in opposite directions and actuate one crank shaft substantially as herein set forth.

2. A single-cylindered engine containing two pistons having unequal strokes and working in opposite directions whereof the rearmost piston is connected by two lateral connecting rods and the foremost piston by one medial rod to the same crank shaft, the cranks of which may be set at any suitable angle to each other the several parts being arranged and operating substantially as herein set forth.

Dated this 18th day of March 1891.

A. CRAWHALL CHAPMAN,

3, St. Nicholas Buildings, Newcastle-on-Tyne, Patent Agent for Applicant.

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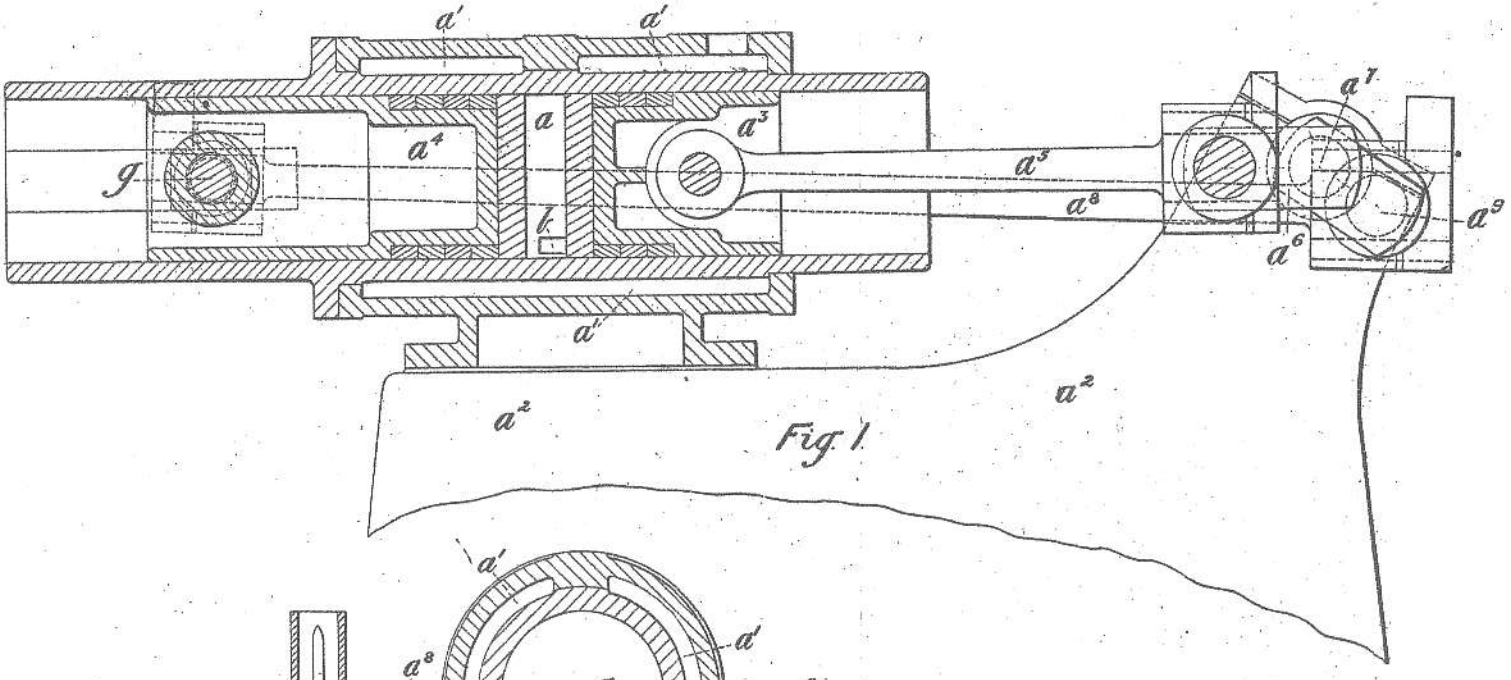


Fig. 1.

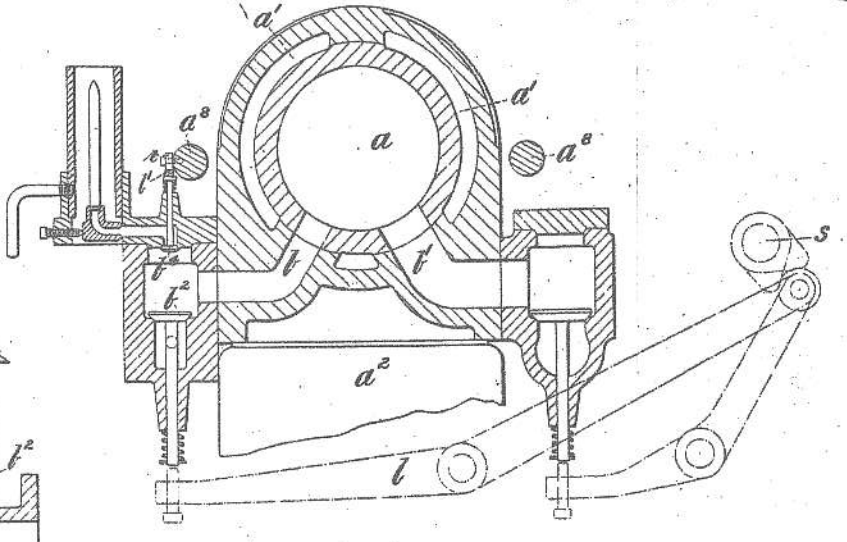
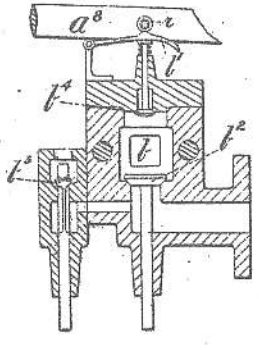


Fig. 2.

Fig. 3.



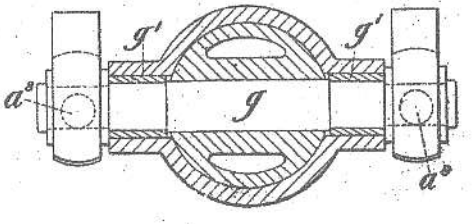


Fig. 4.

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