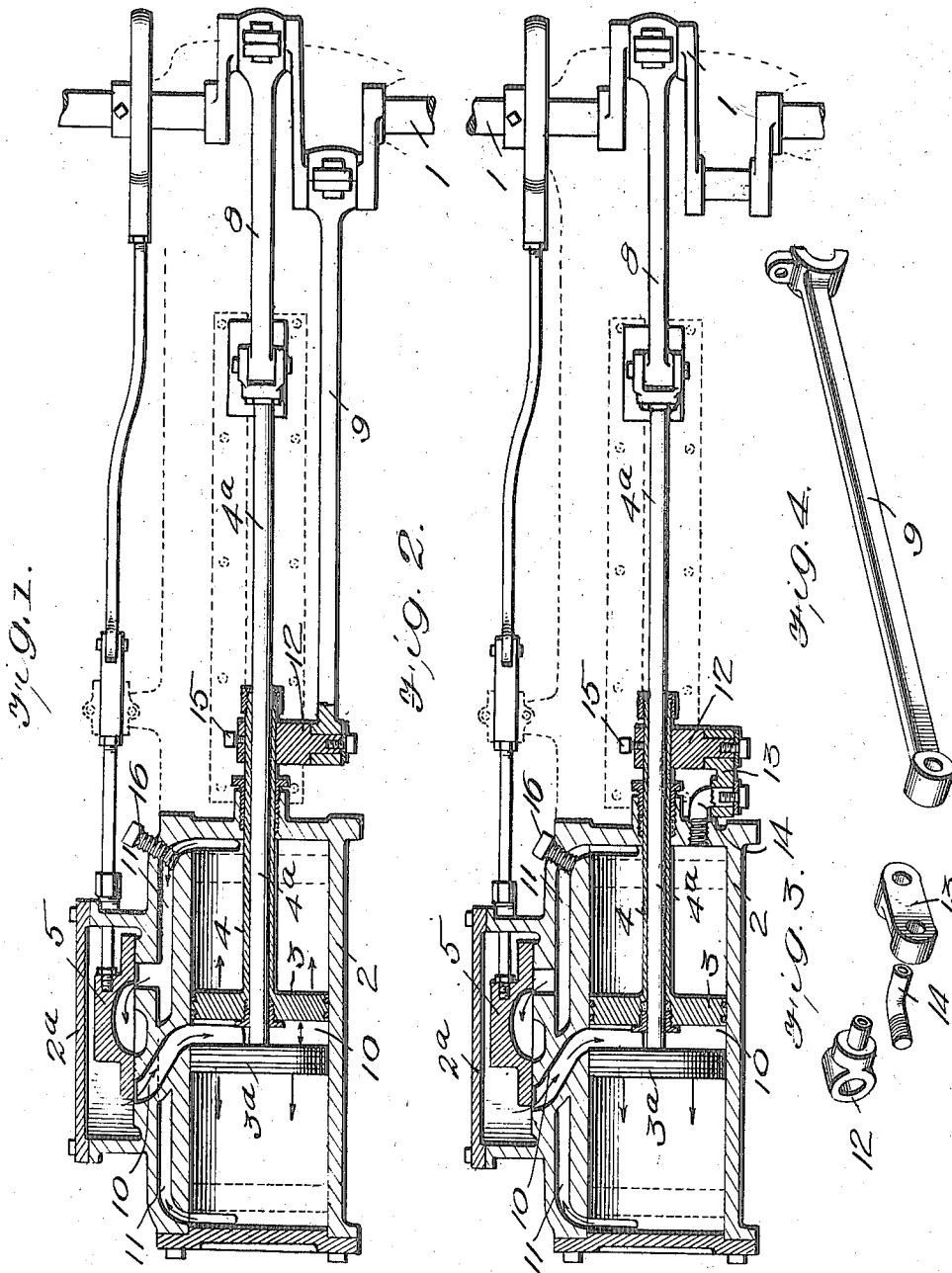


A. R. CARTER.
STEAM ENGINE.
APPLICATION FILED DEC. 9, 1915.

1,181,111.

Patented May 2, 1916.



WITNESSES:

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ARTHUR RICHARD CARTER, OF HAMMOND, LOUISIANA.

STEAM-ENGINE.

1,181,111.

Specification of Letters Patent.

Patented May 2, 1916.

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To all whom it may concern:

Be it known that I, ARTHUR R. CARTER, a citizen of the United States, and a resident of Hammond, in the parish of Tangipahoa and State of Louisiana, have made an Improvement in Steam-Engines, of which the following is a specification.

My invention is an improvement in the type of multiple-piston steam-engines, such, for example, as forms the subject of my allowed application for Patent No. 44563. In that invention, four (4) slidable pistons are employed, the same being connected in pairs whose members reciprocate together, and the piston cylinder is provided with five (5) ports that serve in due order for inlet and exhaust of steam. My present improvement is of a simpler type, there being but two pistons and the cylinder provided with but three inlet and exhaust ports. The improvement is, therefore, particularly adapted for light work; and to still further adapt it, I have made it easily convertible from a two-piston to a single-piston engine by means at once simple but effective.

The details of the improvement are herein described with reference to the accompanying drawing, in which:

Figure 1 is in part a horizontal section and in part a plan view of my improved engine with the movable parts connected for operation in the normal or usual manner. Fig. 2 is a similar view, save that the pitman connected with one of the piston rods is detached and such rod and the piston with which it ordinarily connects are secured in fixed position, whereby the engine is converted into the single-piston type. Fig. 3 is a perspective view of the parts employed for securing one of the pistons in the fixed position. Fig. 4 is a perspective view of the pitman or connecting rod, which is detached, for converting the engine.

The cylinder 2 is provided with a central steam port 10 and two end ports 11. In Figs. 1 and 2 the valve 5 is shown in position to admit steam through the central port, between the pistons 3 and 3^a, so as to drive them apart in opposite directions, as indicated by double-headed arrows, while steam is exhausting through the end ports as indicated by single-headed tailless arrows. Upon the pistons reaching the limit of their outward stroke, which position is indicated by dotted lines, Figs. 1 and 2, the valve is reversed and consequently the port 10 be-

comes the exhaust and the ports 11 admit steam between the pistons and the heads of the cylinder. Thus the pistons are driven apart when steam enters through the port 10, and are driven toward each other simultaneously when steam is admitted through ports 11. It is obvious that these opposite movements of the piston require correspondingly opposed positions of the cranks on shaft 1. In consequence of the balanced relation of the piston and connected parts, the operation of the engine is remarkably even and steady and smooth.

To convert the engine from the type in which two pistons reciprocate simultaneously, as in Fig. 1, it is necessary one of the pistons shall be fixed in position while the other is left free to reciprocate in the usual manner. To effect this, one of the connecting rods 8 or 9 must be detached, and I preferably remove the rod 9, which, in the double type of engine, is connected with the hollow piston rod by means of a cuff or block 12 having at one end a bore or eye to receive the piston rod, and at the other a reduced portion constituting a wrist-pin. On this wrist-pin the connecting rod 9 is mounted. To hold the piston 3 fixed in position, the cuff 12 is rigidly connected with the adjacent end of the cylinder by means of a link 13, and an elbow-shaped rod 14, which screws into the end of the cylinder and thus serves as a supporting bracket. Thus the cuff 12 serves in the two-piston type engine for attachment of the connecting rod 9, and in the single-type engine it serves as one of the means for securing the hollow piston rod rigidly connected with the cylinder. The cuff is secured to the hollow piston rod by means of a clamp-screw 15. With the piston 3 thus secured rigidly in the position indicated it will be seen that it takes practically the place of the right-hand end of the cylinder 2, steam being alternately admitted to, and exhausted from, the space 10 between the two pistons, and the cylinder space on the left-hand side of the removable piston 3. In brief, by the attachment described one piston is fixed and the other left free to reciprocate, whereby the engine is particularly adapted for performing light work economically. The conversion of the engine from one type to the other may be very easily and quickly effected. A screw plug 16, or some equivalent device, must be employed to close the

right-hand steam port 11 to effect conversion to the two-piston type.

I claim:—

1. The improvement in steam engines of the multiple type, consisting of a cylinder having a central and end ports which serve alternately for inlet and exhaust, a valve governing the admission of steam, and two pistons adapted to reciprocate in opposite directions, simultaneously, rods detachably connecting said pistons with the crank shaft, and means for securing one of the piston rods to the cylinder and thus holding a piston out of action, as described.

2. The improvement in steam engines of the multiple type consisting of a cylinder having a central and end ports which serve alternately for inlet and exhaust, a valve governing the admission of steam and pistons adapted to reciprocate in opposite directions simultaneously, rods connected with said pistons, a crank shaft, means for securing one of the pistons fixed in position,

the same comprising a removable connecting rod, a cuff secured on the piston rod, a bracket attached to a fixed part of the engine, and a link connecting said cuff and bracket detachably, thus converting the engine from the multiple- to a single-piston type, as described.

3. The improvement described comprising a three port cylinder having one of its ends constructed integrally or solid with the body of the same, a reciprocating valve, and two pistons adapted to reciprocate within the cylinder in opposite directions simultaneously, hollow and solid piston rods connected with the respective pistons, a crank shaft with which the piston rods are in turn connected, and means attached to the hollow piston rod and rigidly secured to the integral end of the cylinder as described.

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Witnesses:

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