

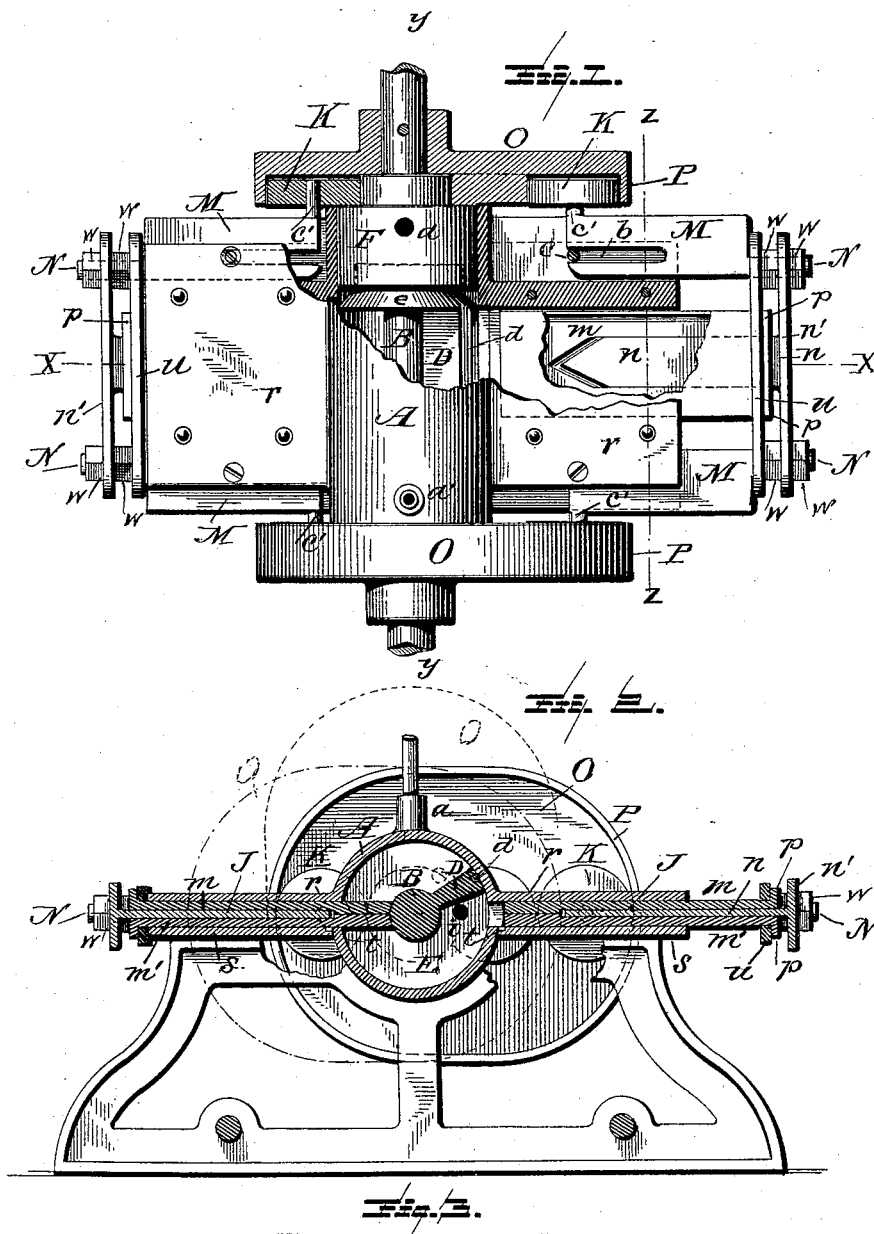
(No Model.)

2 Sheets—Sheet 1.

O. TACKMAN.
STEAM ENGINE.

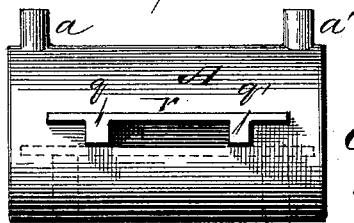
No. 454,086.

Patented June 16, 1891.



Witnesses

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UNITED STATES PATENT OFFICE.

OTTO TACKMAN, OF YONKERS, NEW YORK.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 454,086, dated June 16, 1891.

Application filed December 26, 1890. Serial No. 375,916. (No model.)

To all whom it may concern:

Be it known that I, OTTO TACKMAN, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in a Steam-Engine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

Figure 1 of the drawings is a top plan view of my improved engine, partly in section; Fig. 2, a longitudinal vertical section thereof, taken on line $x x$ of Fig. 1; Fig. 3, a side elevation of cylinder, showing the guide for the abutment; Fig. 4, a vertical section through the main shaft and cylinder, taken on line $y y$ of Fig. 1; Fig. 5, a sectional view taken through the abutment and guide on line $z z$ of Fig. 1; Fig. 6, an interior view of the cam-plate for operating the abutment; Fig. 7, a detail view of the abutment; Fig. 8, a side elevation of the piston and piston-heads of the cylinder; Fig. 9, a detail view showing the means for reversing the engine.

The object of the present invention is to construct an engine which will have a continuous motion in one direction, thereby overcoming the objection to the reciprocating engine which is required to reverse its moving parts, such as the cross-head, piston-rod, and the piston, thereby consuming a considerable part of the power.

A further object is also to operate the engine without intermission valves or valve-gear, reversing-valves alone being used to change the course of the steam to reverse the engine.

The several objects above enumerated I attain by the construction substantially as shown in the drawings and hereinafter described and claimed.

In the accompanying drawings, A represents the cylinder provided with the two ports $a a'$, which may be either the inlet or exit port for the steam, according to the position of the reversing-valves, hereinafter described.

Passing through the cylinder A is the main shaft B, upon which is rigidly secured or made in one piece therewith the cylinder-heads E, and between these heads is located the pis-

ton D, which extends from the shaft out to the inner periphery of the cylinder, the outer edge of the piston being provided with a longitudinal groove d for the reception of suitable packing. The heads of the cylinder are made smaller than the cylinder on their outer ends, with an inclined shoulder e extending around the heads and out to the interior of the cylinder, as shown more clearly in Figs. 4 and 8.

Fitting within the ends of the cylinder A are the steam-chests F, which are in the shape of a cup, with an inner sleeve f fitting over the shaft and abutting against the heads E, and an outer sleeve g upon each steam-chest fits the cylinder and over the heads E thereof. The space h , formed by the end of the outer sleeve and the inclined shoulder on the cylinder-heads, is to form a receptacle for suitable packing. The ports $a a'$, as will be noticed, extend through the outer sleeves g into the steam-chest, and through each cylinder-head E is a port i , which leads from the chest into the cylinder.

The reversing-valves H consist of a plug-valve, one side of which being cut away and so adjusted with relation of one to the other that in one position steam may be admitted on one side of the piston while it exhausts on the other.

As shown in Fig. 4, steam from the pipe I is passing to the left end of the cylinder through the port a , while the exhaust passes out through port a' and pipe L, and the valves H, by means of the handles $k k$ and rod l , are operated together by one movement.

It will be seen by the foregoing description that the friction of the parts are reduced to a minimum, as the cylinder-heads, revolving with the shaft, are balanced, and a very slight pressure is required to prevent leakage of steam past the cylinder-heads upon the packing in the spaces h .

The abutments shown at J confine the steam between them and the piston, and are made movable in and out of the cylinder to permit the piston to pass during its revolution. The abutments consist of an upper and lower plate $m m'$, having on their outer ends the flanges p , each plate being recessed on the sides, where they come together for the reception of the wedges n . Slotted plates u are pro-

vided for the reception of the plates *m m'*; through which they extend, the flanges *p* coming in contact with the latter-mentioned plates, to which the wedges *n* are adjustably fastened by means of the heads *n'*. The guide for the abutments are formed by the plates *r* and *s*, the former being cast on the cylinder, while the latter is separate and made fast to it and the spacing-pieces *q* by means of the bolts *v*.

The abutment-arms *M* have screw-threaded rods *N* at their outer ends, which pass through the plates *u* and the heads *n'* of the wedges *n*, and are provided with nuts *w*, by which the wedges are adjusted. The abutment-arms *M* at their inner ends have open slots *b* to form guides by means of the pins *c*, and said arms have at their inner ends laterally-extending journals *c'*, upon which are placed the rollers *K*. The abutment-arms *M* are placed upon the outside of the abutment-guides, the upper and lower plates of the guides extending far enough to form guides for the rods with reference to any vertical movement, the lateral movement being controlled by the slot *b* and pin *c*. The lower guide-plate *s* is made steam-tight where it comes in contact with the cylinder by means of the packing *t*. The cam-wheels *O* have the flanges *P*, by which the abutments are made to operate by means of the abutment-arms *M* and rollers *K* at the proper time to permit the piston to pass. By placing the abutment-arms *M* on each side of the abutments *J* and using two cam-wheels *O* there is no binding of the abutments *J* when being operated.

In describing my invention I desire it understood that it is capable of many changes or modifications in the several details of construction without departing from the principle of my invention, and any such changes as would come within ordinary mechanical skill I reserve the right to make without in any manner affecting the essential features of the invention.

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

1. In a rotary engine, the combination of

the cylinder and the rotary heads reduced at their outer ends and provided with ports on either side of the piston with steam-chest in the ends of the cylinder, substantially as and for the purpose described.

2. In a rotary engine, the combination of the cylinder with the rotary heads provided with ports upon each side of the piston and reduced at their outer ends, and the piston and the steam-chests in the outer ends of the cylinder and extending over the reduced portions of the cylinder-heads, whereby a stuffing-box is formed for the heads, substantially as and for the purpose set forth.

3. In a rotary engine, the combination of the piston and cylinder with an abutment formed of two plates, a wedge between the plates, and means for adjusting the wedge, substantially as and for the purpose described.

4. In a rotary engine, the combination of the piston and cylinder with an abutment formed of two plates, a wedge for adjusting the plates, the abutment operated by a cam, and means on the rod for adjusting the wedges, substantially as and for the purpose described.

5. In a rotary engine, the combination of the cylinder, the rotary cylinder-heads, the piston between the heads, the ports in the heads, the abutment consisting of two plates adjusted by means of a wedge, and cams for operating the abutments, substantially as and for the purpose set forth.

6. In a rotary engine, the combination of the cylinder with the rotary cylinder-head, the piston between the heads, the ports in the heads, the steam-chest in the ends of the cylinder and extending part way over the heads, a two-part abutment adjusted by a wedge, and cams for operating it, substantially as and for the purpose described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

OTTO TACKMAN.

Witnesses:

D. A. DORCUS,
B. J. DEVITT.