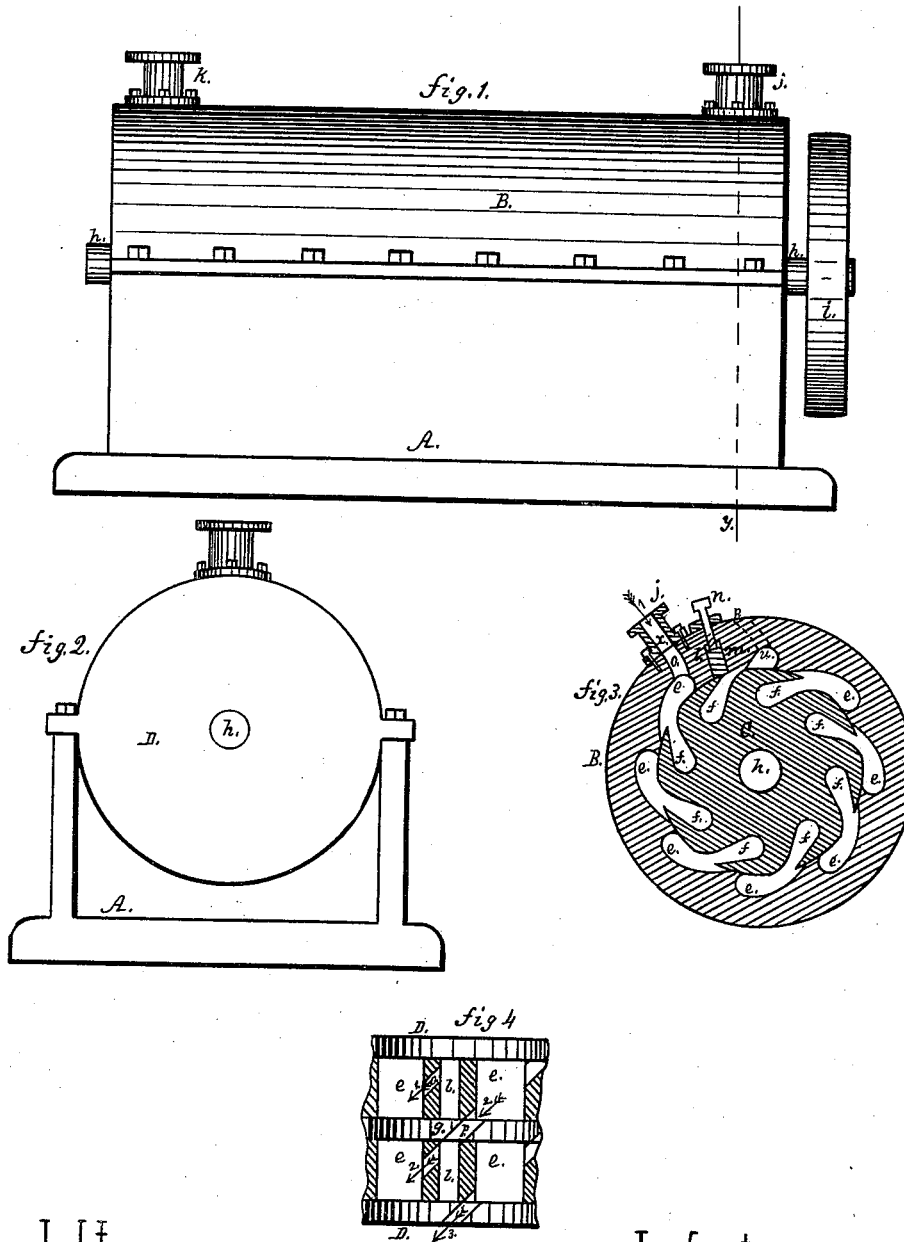


R. CAMPBELL.  
Rotary-Engine.

No. 215,717.

Patented May 27, 1879.



Witnesses  
James Johnston.  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **215,717**, dated May 27, 1879; application filed November 21, 1878.

*To all whom it may concern:*

Be it known that I, ROBERT CAMPBELL, of the city and county of Allegheny, in the State of Pennsylvania, have invented a certain new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to rotary steam-engines, in which two or more communicating series of steam compartments or chambers are formed between the wheel or piston and its inclosing-case.

My improvement consists in the arrangement of two or more series of steam-chambers in the wheel or piston and its inclosing-case, with a steam-supply port which leads through the case into the first series, and an adjacent exhaust-port which leads through the same from the first into the second series, all substantially as hereinafter more fully described and claimed.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a side elevation of a rotary steam-engine embodying my improvement. Fig. 2 is an end elevation of the same. Fig. 3 is a transverse section of the case and cylinder at line *y* of Fig. 1. Fig. 4 is a detail view, representing the steam-chambers and the manner of supplying them with steam.

In the accompanying drawings, A represents the base or frame, to which the case B is secured. Within the case B is fitted a cylinder or piston C. The case B is furnished with two or more distinct series of steam-chambers, *e*, and the cylinder or piston C is furnished with two or more distinct series of steam-chambers, *f*, corresponding in number to the number in case B. The two distinct series of steam-chambers are separated by a partition, *g*.

The case B and cylinder or piston C may be furnished with any desired number of distinct series of steam-chambers, arranged and op-

erating with relation to each other in the same manner as herein described for the engine having only two distinct series of steam-chambers.

The axis *h* of the cylinder or piston C has its bearing in the ends D of the case B, and on one end of the axis *h* is a belt-pulley, *i*, on which may be placed a belt for driving any desired machinery.

The steam-supply pipe leading from the boiler is attached to the pipe *j*, and should be provided with a suitable throttle-valve.

The pipe for carrying off the exhaust-steam may be attached to the pipe *k*.

In the case B is a recess, *l*, for a packing-strip, *m*, which is adjusted by set-screws *n*.

The skillful mechanic, by reference to the foregoing description and the accompanying drawings, will readily understand the construction of the engine. I will therefore proceed to describe its operation, which is as follows:

The steam enters one of the steam-chambers *e* through the steam-ports *o*, as indicated by the arrow 1 in Fig. 3, and causes the cylinder to turn on its axis *h*, which will bring the steam-chambers *f* in the cylinder C consecutively under the steam-port *o*, as shown at *x* in Fig. 3. The steam, after having been carried around in the chambers *e* and *f* from *x* to *u*, is conveyed from the first series of steam-chambers into the second series through the exhaust-port *p*, which leads from the first series of steam-chambers into the second series, as indicated by the arrow 2 in Fig. 4, and the steam, having performed its office in the second series of steam-chambers, may pass into a third series, as indicated by the arrow 3, and so onward through any desired number of distinct steam-chambers, whereby the expansive force of the steam may be utilized in revolving the cylinder C on its axis *h*, from which the motion and power may be conveyed, through the medium of the pulley *i* and a belt, for the purpose of driving machinery.

The case B may be incased with wood or metal, and heated by any of the known means now employed for protecting and heating the outer surface of steam-cylinders of steam-engines.

By the construction of steam-engines as

hereinbefore described, the steam is applied in the most direct manner for obtaining motion and power, and the expansive force of the steam may be utilized to the most possible limit.

Having thus described my improvement, what I claim as of my invention is—

In a rotary engine, the combination, with the

piston C, provided with the steam-pockets *f* and partition *g*, having inclined passage *p*, of the case B, having the supply-port *o*, steam-pockets *e*, and exhaust, as herein specified.

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Witnesses:

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