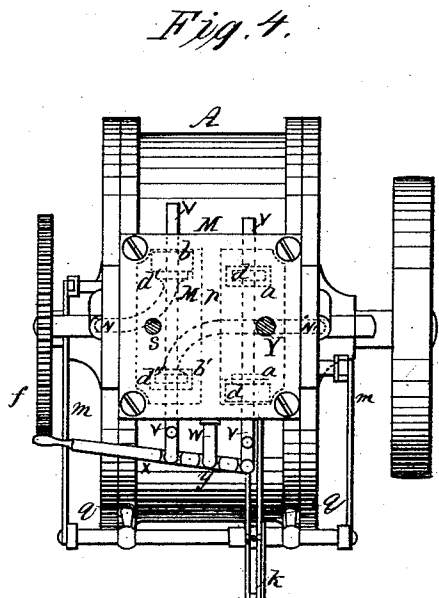
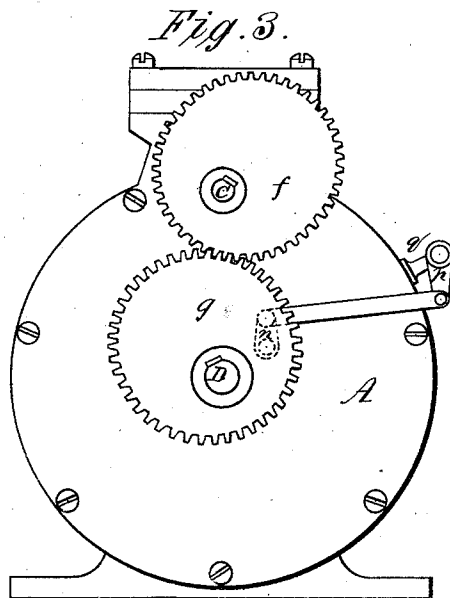
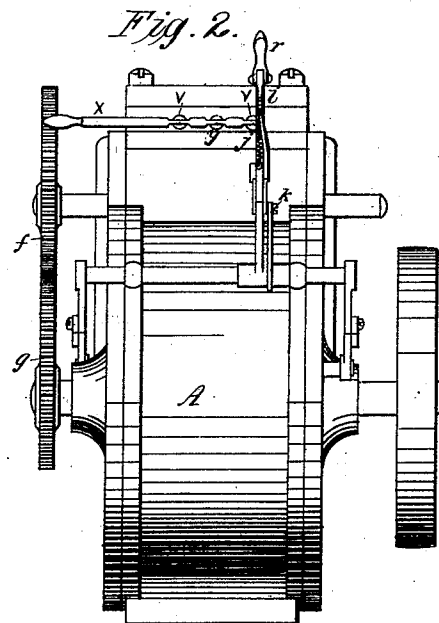
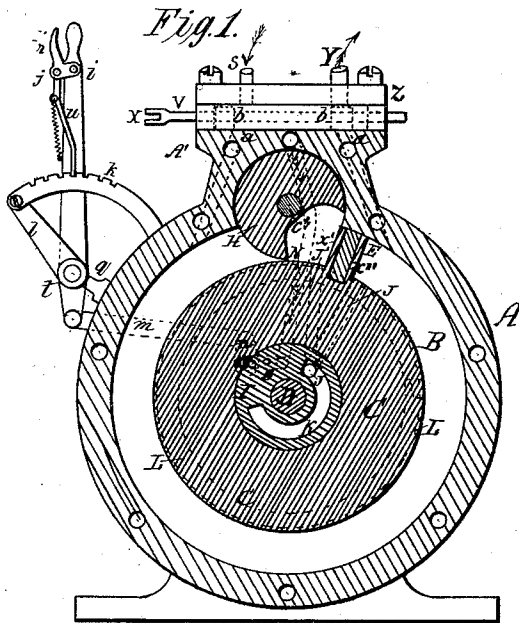


P. ENGLISH.
Rotary-Steam Engines.

No. 156,077.

Patented Oct. 20, 1874.



Witnesses

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UNITED STATES PATENT OFFICE.

PETER ENGLISH, OF HAMILTON, CANADA.

IMPROVEMENT IN ROTARY STEAM-ENGINES.

Specification forming part of Letters Patent No. **156,077**, dated October 20, 1874; application filed December 12, 1873.

To all whom it may concern:

Be it known that I, PETER ENGLISH, of the city of Hamilton, in the county of Wentworth, in the Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Rotary Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same.

By reference to the annexed drawings, it will be seen that Figure 1 is an end view with the cover removed. Fig. 2 is an outside side view. Fig. 3 is an end view, showing the cover bolted on with the gears in their working position. Fig. 4 represents a top view of the engine. Figs. 5 and 6 represent longitudinal and top views of the steam-block. Fig. 7, Sheet 2, is an upright section through the center of the engine.

A is a cast-iron cylinder, of any suitable size. Inside of said cylinder is a steam-chamber, B, seen at Fig. 1. C is a drum inside of said cylinder, which is keyed on the shaft D. E is a steam-block, the peculiar construction of which will be hereafter described. It is securely fastened in the said drum C and nicely adjusted to fit and operate in the steam-chamber B. The said block consists of two side plates or walls, $x' x''$, securely fastened in the drum C, and having a solid central piece, E' , somewhat smaller than the said outside plates, leaving a small space between them on top and ends. $b'' b''$ are two movable pieces, fitted between the said side walls $x' x''$. They are jointed in the center. 2 2 2 are small pins or screws, which are made to pass through oval holes 7 7 7 7 in the said plates $b'' b''$ into the central piece E' , for the plates b'' to slide on. Small spiral springs $c c$ are let into the top of the piece E' , which serve to push the said plates b'' upward to the surface of the steam-chamber B, while the end springs $e e$ serve to push the said plates laterally, for the purpose of making the block steam-tight. H is a small drum, keyed on the shaft c in the upper part of the machine it is intended to revolve, and has a portion of its side cut out of it to allow the steam-block to pass it on each revolution. Its use is to back the steam. I is a circular steam-tight plate, having one-quarter of its face solid and three-

quarters of its surface with a groove, k , cut into it, as shown in Fig. 1, for the purpose of admitting steam to the steam-chamber B through the open steam-port J. There is a corresponding one on the opposite side for reversing the engine. L is an unequal-sized ring on the side of the drum C, let into the cylinder-cover, and is for the purpose of keeping the drum steam-tight and taking up its own lost motion as it wears. There are two of said rings, and they are turned about one-quarter of an inch larger than the diameter of the groove they rest in, so that they will expand as their faces are worn by the friction. The pressure of the rings coming against the outside of the grooves causes them to be steam-tight, as they wear, and by having their backs beveled the pressure pushes them forward. The said rings on each side are stationary on the cover, and the drum works on the face of them. Their being constructed eccentric-shaped causes equal pressure on the ends of them, as there will be at the back of them. M is a steam-chest on the upper part of the machine, furnished with valves, as will be described hereafter. N is a steam-port on one side, for the entrance of steam, and the opposite one, N' , on the other side of the steam-block is for reversing the engine. The steam-chest M has a partition, p , running through it, the whole covered with the plate z . S is the outside steam-pipe, for the admission of steam. b is an opening in the bottom of steam-chest, for the passage of live steam to the port N; and b' is a similar opening, for the admission of live steam to the port N' on the opposite side, for reversing the engine. $a a$ are the exhaust-ports, Y being the outside exhaust-pipe. $d' d''$ are the valves which cover the steam-openings $b' b$, and $d d$ are similar valves to cover the exhaust-openings. The said valves have rods $v v$ passing through them, and are opened and closed by action of handle x , as will be more fully shown hereafter.

The steam enters the steam-chest from the steam-pipe S, thence through the steam-passage N on the outside of the cover, thence through an opening in the plate I to the steam-port J in the drum C, said steam-port being L-shaped, and opening into the steam-cham-

ber B. The steam drives the block E, drum C, and shaft D around. The steam is cut off by each revolution of the cut-off block I by means of the solid portion of its face closing the steam-passage N on each revolution of the said block and drum. When the engine requires to be reversed, the steam-orifice *b* is closed by the valve *d'*, and by the same action of the handle *x* the steam-orifice *b'* is opened, which admits the steam to the steam-passage N', which communicates with the steam-port J' in the drum C, which opens on the opposite side of the steam-block E, and drives the said block the reverse way and reverses the engine.

i is a handle, pivoted to the standard *q* at the point *t*. *m* is a connecting-rod, connecting the said handle *i* to the small crank *n*. *o* is a small sliding plate set into the slot 5 in the inside of the cover, and is operated by the said handle, rod, and crank outside, for the purpose of regulating the size of the opening of the steam-port. To use the steam expansively, both sides are operated by the same means at once. *r* is a small handle, attached to the larger one *i*, to operate a spring, *j*, and catch *u*, which drops into any required notch to retain the sliding plate *o* at any desired position over the steam-port. *f* and *g* are two eccentric gears. *g* is keyed on the main shaft D, and *f* on the upper shaft *c*. They mesh into each other, and are for the purpose of keeping the top drum H to its proper place to allow the steam-block E to pass. *a a* are exhaust-pipes. One is used when the engine is worked forward, and the other when backward or re-

versed. Steam is admitted from a pipe at the top, and is led down the steam-pipe N to the steam-chamber B, which drives the steam-block around it, carrying the drum C and cut-off plate I and shaft D. The valves on the steam-chest M are placed on the rods *v v*. W is a standard, fastened to the outside of the engine, to which is pivoted the handle *x* at the point *y*. The said rods *v* are also fastened to the handle. The valves are opened or closed by the action of the said handle.

What I claim as my invention is—

1. In combination with the ports N N' and drum C of a rotary engine, the slot 5 and slide *o* inside of cover A, operated by the crank *n*, connecting-rod *m*, handle *i*, quadrant *k l q*, small handle *r*, spring *j*, and catch *u*, for regulating the steam, substantially as and for the purpose specified.

2. The beveled eccentric-shaped packing-rings L L, arranged in a recess in cover A, in combination with the drum C of a rotary engine, as and for the purpose specified.

3. In combination with the drum C and cover A of a rotary engine, the steam-tight cut-off plate I on the shaft D, sunk in the said drum C, and containing a groove, K, for steam, and pressed outward by the springs G, substantially as and for the purpose specified.

Hamilton, Canada, November 22, 1873.

PETER ENGLISH.

In the presence of—
WM. BRUCE,
H. RAY MYERS.