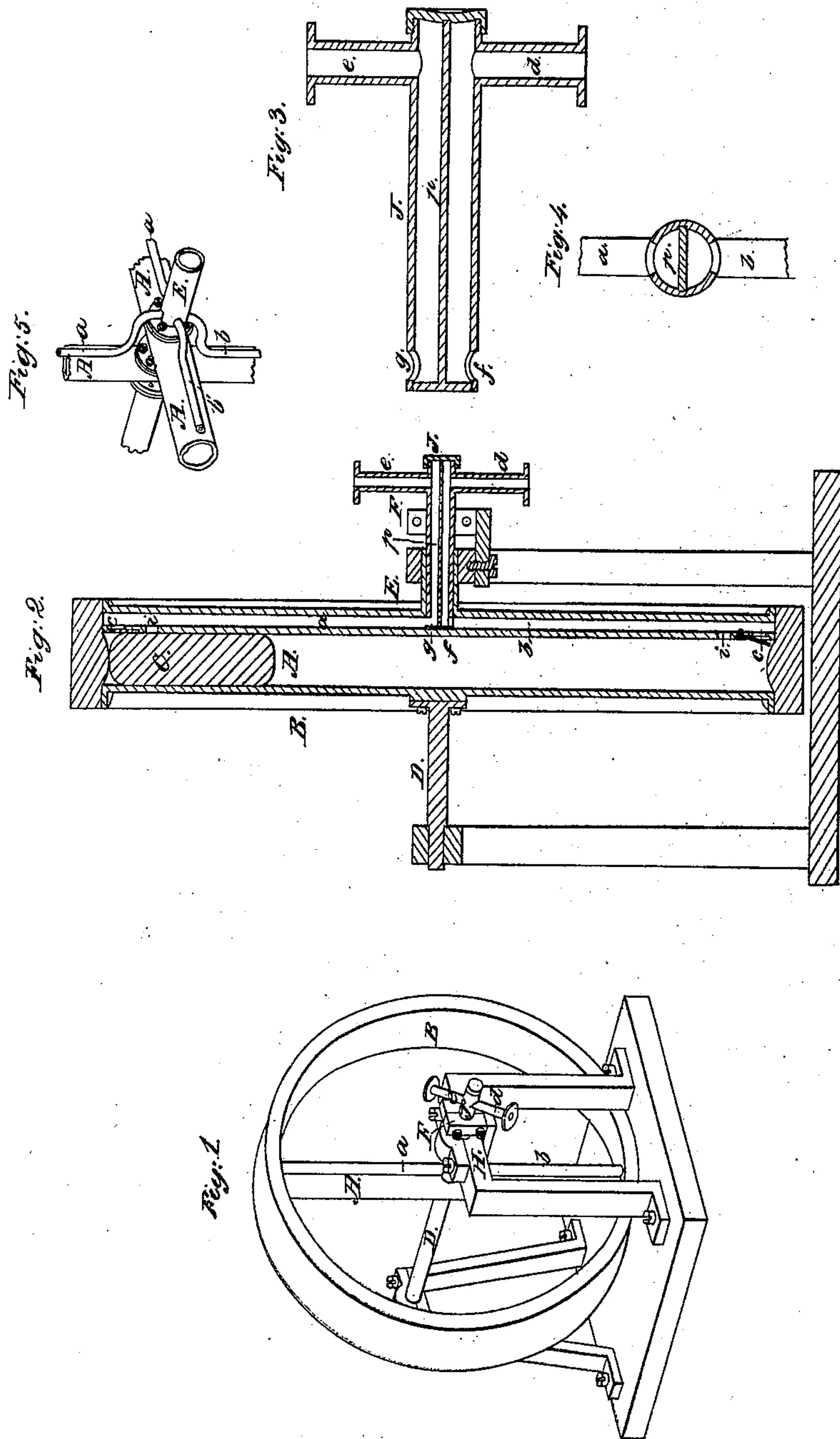


P. C. Curtis,
Rotary Steam Engine.

Nº 5,190.

Patented July 10, 1847.



UNITED STATES PATENT OFFICE.

PHILO C. CURTIS, OF UTICA, NEW YORK.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 5,190, dated July 10, 1847.

To all whom it may concern:

Be it known that I, PHILO C. CURTIS, of the city of Utica, in the county of Oneida and State of New York, have invented a
5 new and improved Rotary Engine; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

10 Figure 1, is a perspective view; Fig. 2, a vertical section, and Figs. 3, and 4, sectional views representing parts of the same in detail. Fig. 5 is a perspective view showing a modified manner of constructing my rotary engine.

Similar letters refer to corresponding parts in all the figures.

A is a hollow cylinder, the ends of which are secured to the inner side of the fly-wheel B; C is a solid piston placed within the cylinder, which should be about one half the length of the same. The cylinder A, and fly-wheel B, are suspended by, and revolve on, the axle D, E, cast solid with, or
25 bolted to, opposite sides of the center of the cylinder, and resting on suitable bearings. The part D, of the axle is solid, and the portion E is tubular.

a, and *b*, are steam pipes placed by the side of, and parallel with, the cylinder A, their inner ends opening into the hollow axle E, opposite each other, and their outer ends communicating with the ends of the cylinder by means of the apertures *c*, *c*, closed by valves opening into the cylinder, and by the apertures *i*, *i*, not closed by valves.

J, is a tube closed at both ends, inserted into, and accurately fitting the bore of the hollow axle E, from which it projects a
40 short distance.

p, is a partition plate dividing the chamber within the tube J, into two equal parts; *d*, is a steam pipe communicating with the lower compartment of the tube J, and *e*, is an escape pipe communicating with the
45 upper compartment of the same.

f, is an aperture through the tube J, into the lower compartment of the same, close to the inner end of the tube, on a line with the
50 steam pipe *d*.

g, is an aperture opposite to *f*, into the upper compartment of the tube, on a line with the escape pipe *e*.

The tube J, is firmly held in place, by the
55 clamp F, which is bolted to the bearing tim-

ber H. As the fly wheel B is revolved, the apertures *f*, and *g*, in the tube J, are brought opposite to the inner ends of the pipes *a*, and, *b*.

The operation of my improved rotary engine is as follows: Steam being admitted to the lower compartment of the tube J, the fly wheel is turned until the inner end of one of the pipes *a*, *b*, is brought opposite to the aperture *f*, when the steam will rush in, descend to the lower end of the cylinder A, pass through the aperture *c*, into the cylinder A, and elevate the piston C, to the top of the same; the weight of the piston will reverse the position of the cylinder and carry around the fly-wheel. Each side pipe
60 *a*, *b*, alternately becomes a steam, and an escape pipe to the cylinder, by the revolution of the fly wheel. The cylinder, in revolving, brings the inner end of the side pipe opening into the rising end of the cylinder, opposite the elongated portion of the aperture
65 *g*, and allows the steam to escape at the moment the cylinder reaches a horizontal position; and just before the cylinder, in revolving, reaches a vertical position, the side pipe, opening into the descending end of the cylinder, comes opposite the aperture *f*, through which the steam enters, and again
70 elevates the piston to the other end of the cylinder, and thus the operation is continued. The piston, as it is elevated, closes the valve over the aperture *c*, and, in consequence, condenses a quantity of steam and air in the end of the cylinder, which prevents the piston from coming in violent contact with the head of the same.

My improved rotary engine may be composed of one, two, three, or more cylinders combined; Fig. 5, represents the manner in which I combine two cylinders with each other, and with the hollow axle E, and solid axle D; and also the manner of connecting their side pipes *a*, *b*, with the hollow axle.

I regulate the power of my engine, by changing the position of the tube J. By letting the steam into the descending end of the cylinder immediately after it passes the center, the power of the engine will be reduced, in consequence of throwing the piston into the opposite end of the cylinder while it is ascending. The greatest power will be obtained by shifting the piston to the upper end of the cylinder at the moment the cylinder reaches a vertical position.

What I claim as my invention, and desire to secure by Letters Patent, is—

The constructing a rotary engine of one, two, or more cylinders, crossing, and being united to each other at their centers, as also to a solid and hollow axle on which they are suspended and revolve, by means of heavy pistons placed within the cylinders, and shifted from end to end by steam admitted
0 to the same, through the lower compartment of the tube J, and escaping through the up-

per compartment of the same through the medium of the side pipes *a, b* connecting the ends of the cylinders with the hollow axle E, and alternately becoming steam and escape 15 pipes, substantially in the manner herein set forth.

PHILO C. CURTIS.

Witnesses:

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GUY C. HUMPHRIES.