S. GIBSON.

Rotary-Engine.

No. 165,559. Patented July 13, 1875.

Fig 1

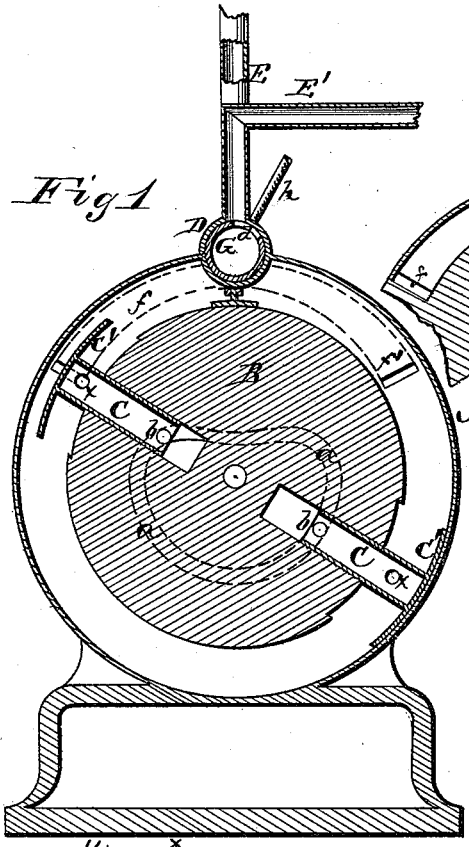


Fig 3

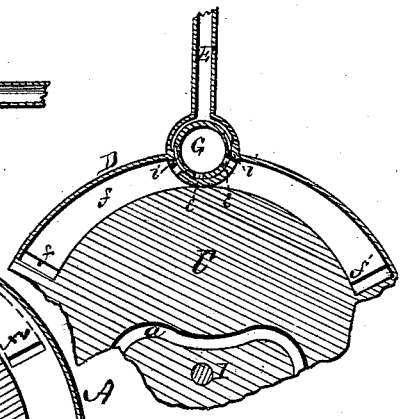


Fig 4

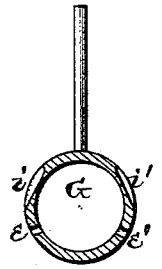


Fig 2

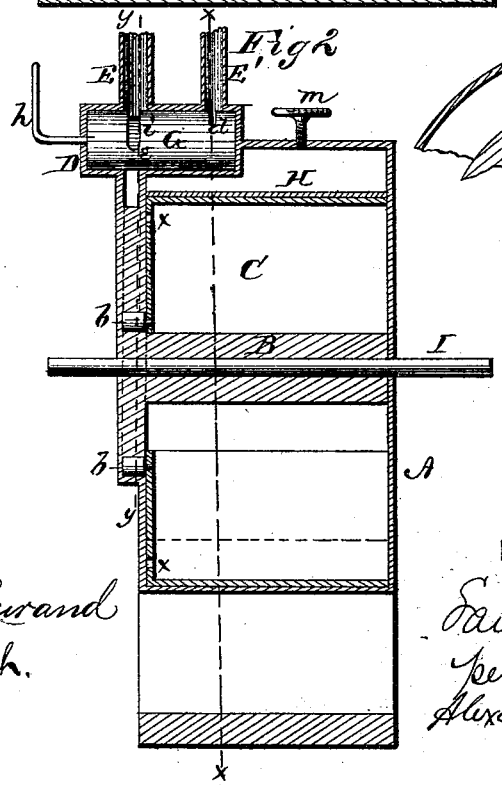
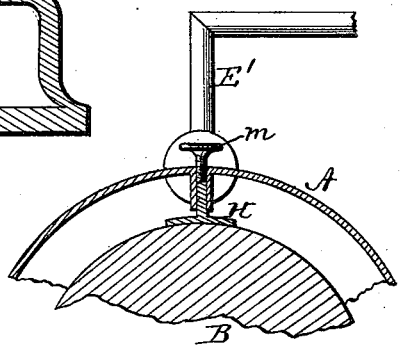


Fig 3



WITNESSES

Franck L. Durand

C. L. Euerh.

INVENTOR

Saml. Gibson.

per

Alexander Mason

Attorneys

UNITED STATES PATENT OFFICE.

SAMUEL GIBSON, OF SHREWSBURY, ASSIGNOR OF ONE-HALF HIS RIGHT TO HIRAM YOUNG, OF YORK, PENNSYLVANIA.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **165,559**, dated July 13, 1875; application filed September 23, 1874.

To all whom it may concern:

Be it known that I, SAMUEL GIBSON, of Shrewsbury, in the county of York and in the State of Pennsylvania, have invented certain new and useful Improvements in Rotary Engine; and 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, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a rotary engine, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal section through line x' x', Fig. 2, and Fig. 2 a transverse vertical section of my rotary engine. Figs. 3 and 4 are sections of detached parts thereof. Fig. 5 represents a section taken through line y y, Fig. 2.

A represents a circular casing of any suitable dimensions, through the center of which passes a shaft, I. On this shaft is secured a wheel, B, concentric with the casing. In the wheel B are made two radial grooves or recesses opposite each other, in each of which is inserted a piston, C, open at its inner end, and provided at its outer end with a shoe, C′. In the circumference of the wheel B are made recesses to receive the valve-caps C′, when the pistons are closed, so as to present a smooth and even surface on the periphery of the wheel. At the inner end of each piston C on one side is a stud, provided with a friction-roller, *b*, which projects into a cam-groove, *a*, formed in one of the heads of the casing A. This groove runs concentric with the wheel and casing for about one hundred and eighty degrees, and both ends of this part are turned inward, and then downward in the center, as shown fully in Fig. 1. Near the outer end of each piston on one side is a steam-inlet port, *x*. In the upper part of the casing A, near one side, is formed a circular valve-chest, D, provided with steam-inlet pipe E and exhaust-pipe E′. The bottom of the valve-chest D communicates with two steam-passages, *f f′*, formed in the head of the casing, the ends of said passages opening into the casing, as represented in Fig. 1. In the valve-chest D is placed a hollow cylindrical valve, G, closed at both ends, and provided at its outer end with a crank or lever, *h*, which passes through the end of the chest into the end of the valve, and by means of which the valve is turned to reverse the engine, as hereinafter described. In the exterior surface of the valve G are made elongated indentations or grooves, forming passages *i i′*, and under these passages are ports *e e′* into the valve. These passages and ports are so arranged that when the valve is in the position as shown in Fig. 4, the steam is entirely shut off from the engine, and when turned to one side the passage *i* will form a communication for the steam from the inlet-pipe E to the passage *f* in the casing, and at the same time the port *e′* will communicate with the passage *f′*, so that the exhaust steam will pass into the valve and through an exhaust-port, *d*, therein to the exhaust-pipe E′. When the valve is turned in the opposite direction the live steam will enter the casing through the passage *f′*, and exhaust through the passage *f*.

The engine being in the position shown in Fig. 1, the piston C is moved out against the interior circumference of the casing A by the cam-groove *a*, and stud and roller *b*, while the other piston is only partly moved outward, and the steam now entering through the passage *f* will enter this latter piston through the port *x*, and pack the piston. At the same time the steam passes around this piston to the one that is entirely out, (it being prevented from passing the other way by an abutment, H,) and forces the wheel around. As soon as one piston is moved entirely out by the cam-groove the steam will act thereon, and the other piston will be drawn in, exhausting the steam through the passage *f′*. By turning the valve G the motion of the engine is reversed.

At the top of the wheel B in the casing is an abutment, H, constructed as shown in Figs. 1 and 3. This abutment is held close to the

outer periphery of the wheel B by means of one or more set-screws, *m*.

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

1. The combination, with the circular casing A, having the cam-groove *a*, as described, of the revolving wheel B, arranged within and concentric with the cylinder, and the hollow pistons C C, moving out and in in the wheel B, and provided with shoes C′, and studs and rollers *b* to move in the cam-groove *a*, and with steam-inlets *x*, all substantially as and for the purposes herein set forth.

2. The combination of the casing A with passages *f f′*, and cam-groove *a*, revolving wheel B, hollow pistons C C, with shoes C′, steam-inlets *x x*, and studs and rollers *b b*, and adjustable abutment H, all substantially as and for the purposes herein set forth.

3. The combination of the casing A with passage *f f′*, cam-groove *a*, revolving wheel B, hollow piston C C, adjustable abutment H, hollow cylindrical valve G, with ports *d* and *e e′*, and passages *i i′*, steam-chest D, and inlet and exhaust pipes E E′, all substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of August, 1874.

SAML. GIBSON.

Witnesses:
H. A. HALL,
C. M. ALEXANDER.