

G. S. Follansbee,

Rotary Engine.

No. 106,804.

Patented Aug. 30. 1870.

FIG. 1.

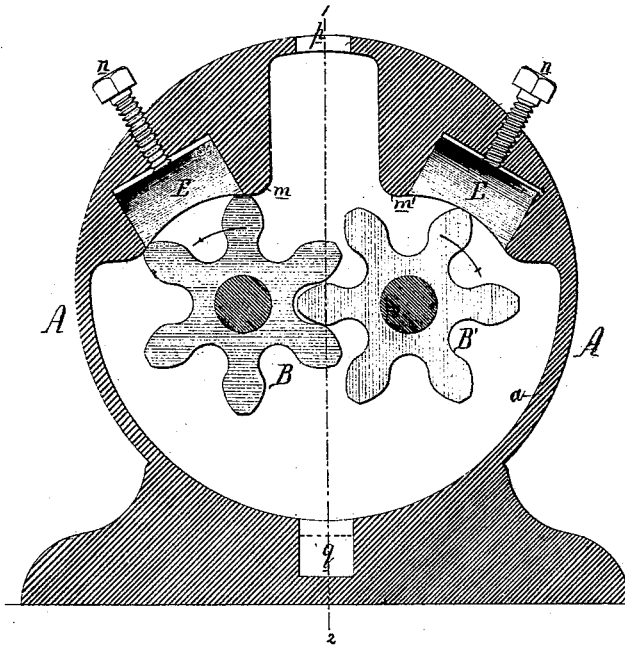


FIG. 2.

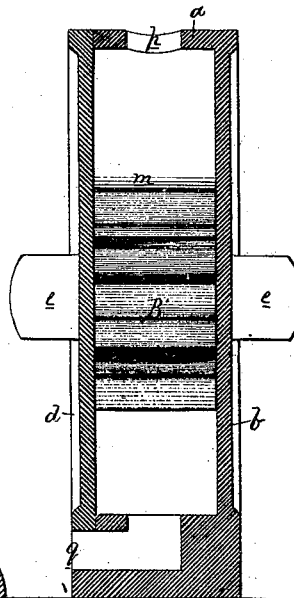
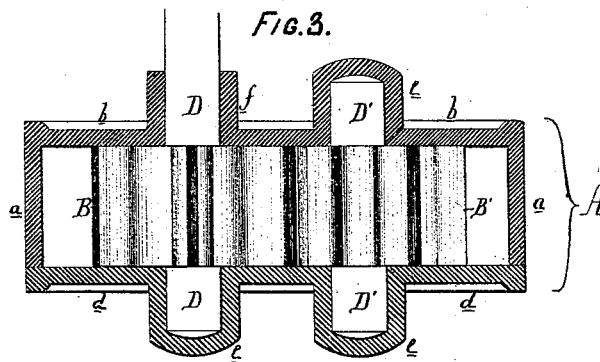


FIG. 3.



WITNESSES *Wm. A. Steel.*
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By his Atty
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GEORGE STORES FOLLANSBEE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND JOHN ROSENCRANTZ, OF SAME PLACE.

Letters Patent No. 106,804, dated August 30, 1876.

IMPROVEMENT IN ROTARY STEAM-ENGINE OR PUMP.

The Schedule referred to in these Letters Patent and making part of the same.

I, GEORGE STORES FOLLANSBEE, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented a Rotary Steam-Engine or Pump, of which the following is a specification.

Nature and Object of the Invention.

My invention consists of certain improvements, fully described hereafter, in that class of rotary steam-engines in which two cog-wheels, geared together, are caused to revolve in a closed casing by the pressure of steam, or in that class of pumps in which two similar wheels are caused to revolve in a casing for the purpose of drawing and forcing fluids.

Description of the Accompanying Drawing.

Figure 1 is a vertical section of my improved rotary engine or pump;

Figure 2, a transverse vertical section on the line 1 2, fig. 1, and

Figure 3, a sectional plan.

General Description.

A is the outer casing of the engine, and consists of a short cylinder, *a*, projecting from and forming a part of the rear plate *b*, a detachable front plate *d*, being so secured to the open end of the cylinder as to form a perfectly steam and water-tight joint.

The inner face of the permanent plate *b* is made perfectly true, and parallel with the trued inner face of the detachable plate *d*, so that the two cog-wheels, B and B', can revolve freely between them without having any lateral movement, for the fitting of the wheels between the plates should be so accurate as to afford no leakage, and yet so free that there will be no friction of the wheels against the plates.

One end of the shaft D of the cog-wheel B passes through a tubular bearing, *f*, on the plate *b*, and this bearing may be furnished with a suitable stuffing-box, but the opposite end of the shaft turns in a simple closed bearing, *e*, on the plate *d*, and both ends of the shaft D' of the cog-wheel B' turn in similar closed bearings.

The teeth of these cog-wheels are so accurately formed and finished that one tooth of one wheel will always be in close steam and water-tight contact with a tooth of the other wheel, so that there can be no leakage between the wheels at the points where the teeth of one gear into those of the other.

Upon projections within the casing A are two segmental bearings, *m m'*, one concentric with one wheel, and the other with the other wheel, and of such extent that only two teeth of either wheel can at the same time be adjacent to either bearing.

These bearing-surfaces may in some cases be permanent, but, as the points of the teeth of the wheels must revolve in contact with them, and as they must, consequently, be subjected to considerable wear, I prefer to make these bearing-surfaces adjustable, as shown in fig. 1, where E E represent blocks, (of hardened steel, if desired,) rendered adjustable in recesses in the casing by means of set-screws *n n*, by turning which the blocks may be set up when worn away by the action of the teeth.

When steam is admitted to the interior of the casing A through the opening *p*, the wheels B and B' will revolve rapidly in the direction of their arrows, and the motion thus obtained being transmitted through the projecting end of the shaft D, and through a driving-belt, or any desired system of gearing, to any adjacent machine, the steam passing off from the casing through the exhaust-openings *q*.

It will be readily understood, without explanation, how the machine can be used as a pump by connecting the suction-pipe to the opening *q* and the discharge-pipe to the opening *p*, and imparting a rotary motion to the shaft D.

In ordinary engines or pumps the teeth of the wheels revolve in proximity to the entire curved inner surface of the casing between the steam-supply and exhaust-ports, a considerable loss of power resulting from the consequent friction.

This loss of power is avoided in my improved apparatus, where the teeth revolve adjacent only to projecting portions of the casing, the curved faces of which are but little greater in extent than is necessary to permit the contact of two teeth of either wheel at the same time, the other teeth being free from contact with any surface.

I am aware that projections with curved faces have been arranged in casings, so as to afford bearings for blades sliding in eccentric revolving cylinders; but the amount of friction which results from this arrangement is too great to permit the practical use of the engines, while the reduction of the bearing-surfaces of a cog-wheel engine, as described, imparts to the same an efficiency which such engines have not heretofore possessed.

By providing a positive adjustment for the sections E, they may be brought as close as necessary to the cog-wheels without being caused to bear against the same, a steam-tight bearing being thus obtained without the friction being increased.

Claims.

1. The case A, with its ports *p q*, internal projections and curved bearing-surfaces *m m'*, arranged, in respect to the ports, as set forth, and cog-wheels B

B', attached to independent axles, one only of which extends through the casing, all as described.

2. The combination of the subject-matter of the first claim, adjustable blocks E E, and set-screws n, whereby a positive adjustment of the blocks may be obtained.

In testimony whereof I have signed my name to

this specification in the presence of two subscribing witnesses.

GEORGE STORES FOLLANSBEE.

Witnesses:

HARRY SMITH,
LOUIS BOSWELL.