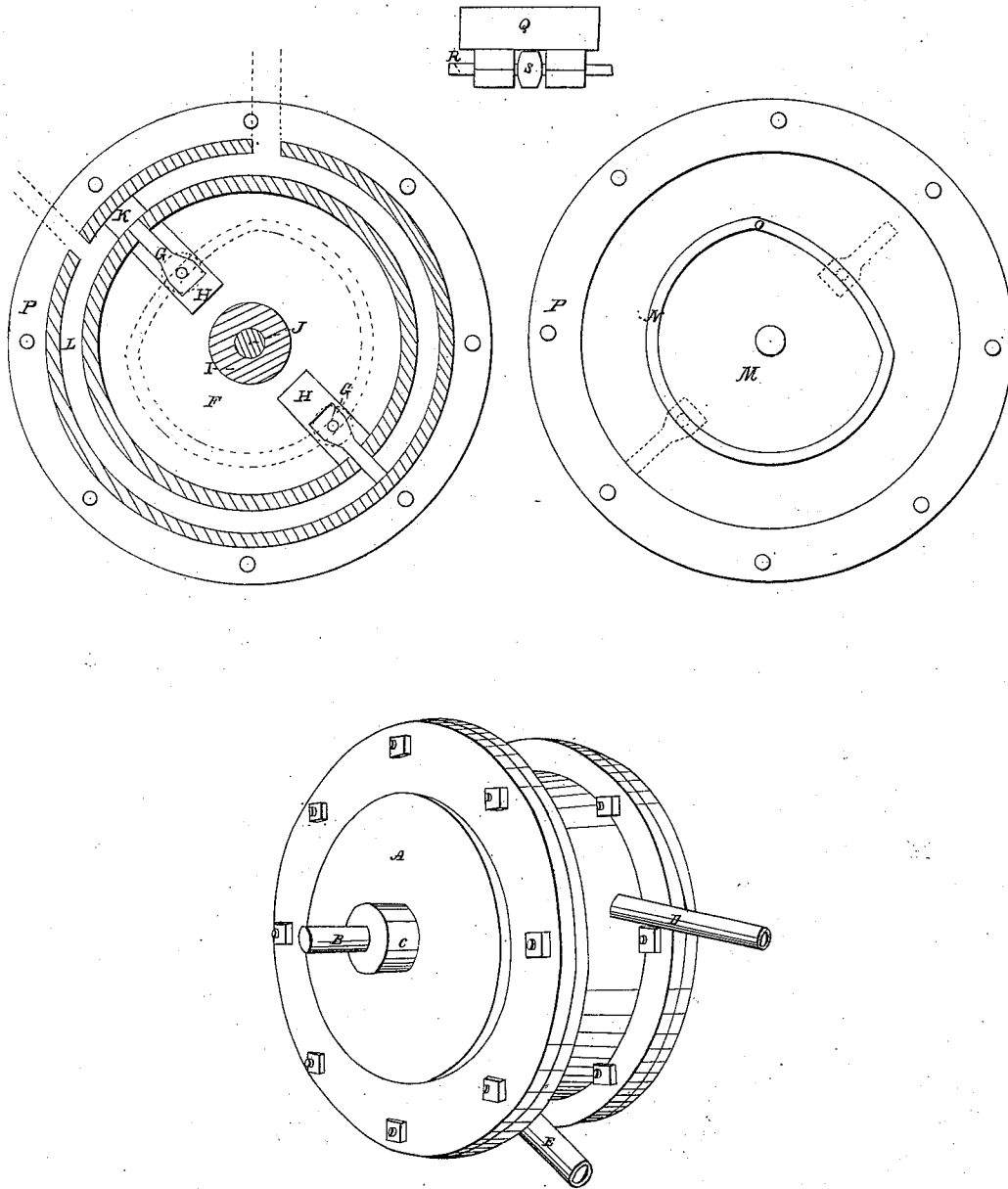


*Grannis & Brand.*  
*Rotary Steam Engine.*  
*N<sup>o</sup> 316.      Patented July 29, 1837.*



# UNITED STATES PATENT OFFICE.

D. GRANNIS AND D. E. BRAND, OF COLLINS, NEW YORK.

## ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 316, dated July 29, 1837.

*To all whom it may concern:*

Be it known that we, DAVID GRANNIS and DAVID E. BRAND, of the town of Collins, in the county of Erin and State of New York, have invented a new and useful Improvement in Steam-Engines for Propelling Boats, Locomotives, Manufactories, and other Machinery, which improvement is on the rotary principle and is called a "Rotative Engine;" and we do declare that the following is a full and exact description thereof.

A cylinder is formed in the following manner: Is made of cast-iron or some other firm metal—the body of the cylinder of sufficient length to admit the contemplated wheel to run inside of the head of the cylinder, on the edges of which flanges are made and turned perfectly true to correspond with the two heads of the cylinder, which heads are to be of cast iron turned equally true, with a hub in the center on the outside for the shaft to pass through. The heads and body of the cylinder are then fastened together with screw bolts. Before putting the cylinder together, a wheel of cast iron or some metal is made, the height of which shall nearly fill the vacancy between the heads of the cylinder, but the diameter of which shall be as much less than that of the cylinder as the width of the bucket intended to be operated upon. Flanges are also raised on the ends of the wheel, turned true so as to fit perfectly up to the inner surface of the cylinder. The outer surface of the wheel between the flanges must be turned perfectly true. A stationary valve or stop is inserted between the flanges of the wheel to fill the vacancy between the body of the wheel and the inner surface of the cylinder, to be fastened by screw bolts passing through the cylinder. This confines the steam on one side of the wheel. The body of the wheel is made in the form of a cylinder, with a plate or head in the center with a hub on both sides of it through which the shaft passes—two gains are made through the body of the wheel between the flanges directly opposite each other and of sufficient depth in the plate of the wheel to admit the bucket to draw so as to pass the stationary valve, the buckets are made to fill the gains in the wheel, but the gains in the plate are made some larger to

admit a roller to work in it which is attached to the bucket to prevent it from cramping; and in order to draw the bucket under the stop a circular groove is turned in each head of the cylinder a little within the circle of the rim of the wheel. Or it may be preferable to raise a guide on the head of the cylinder upon which a crotch on the end of the pin is to be fitted. This groove, or guide, is on a true circle two thirds of the way around or more, it then diverges inwardly as much as you design to draw the bucket, so as to pass the stop. On the inner edge at each end of the bucket an eye is formed through which a pin passes, the ends of which fill the grooves or fit on the guide in the head of the cylinder. This pin when running in the regular groove, or on the guide carries the the bucket out to the inner surface of the cylinder. When the steam lets off, the pin passes through the eccentric groove, or upon the excentric guide, draws the bucket under the stop and passes out again into the regular circle, filling the vacancy between the wheel and the cylinder. The roller before mentioned works on the same pin beneath the eyes of the bucket and rolls in the gain cut in the plate of the wheel. Packing plates may be used and fastened to the flanges of the wheel with a hollow turned in the edge of the flanges and plates to receive the packing, and may be tightened by screws as occasion may require, the wheel must be hung and turned on the shaft, and the shaft so turned as to now close in the heads of the cylinder. On each side of the stop is an insertion made into the cylinder, one for the steam pipe, the other for the eduction pipe. Or if it is desired to work the wheel both ways, two insertions may be made on each lid of the stop.

What we claim as our invention and desire to secure by Letters Patent, is—

The manner above described of working the draw buckets by means of pins working in grooves, or upon guides made upon the inside of the heads of the cylinder.

DAVID GRANNIS.  
DAVID E. BRAND.

Witnesses:

JOSEPH PLUMB,  
JOHN L. HENRY.