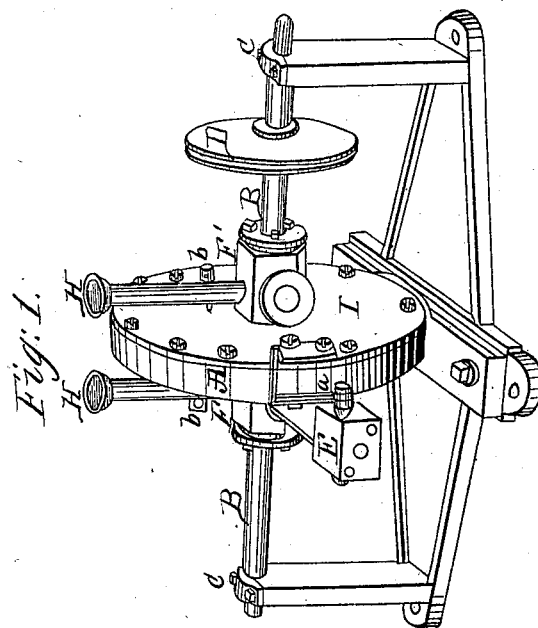
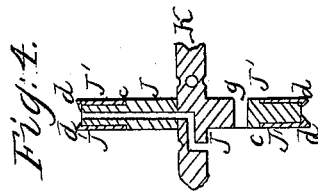
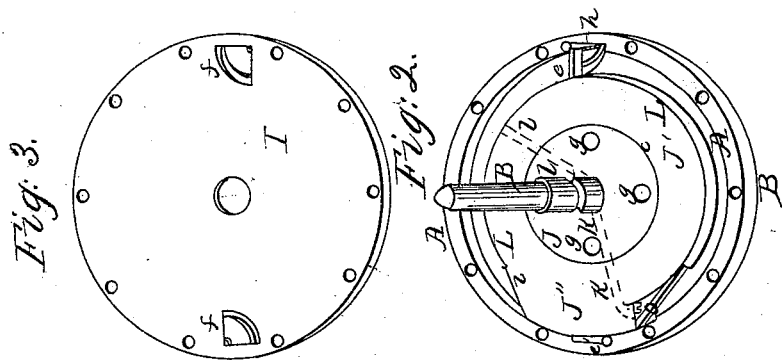


*J. C. Robie,*  
*Rotary Steam Engine.*  
*N<sup>o</sup> 1,862.      Patented Nov. 26, 1840.*



# UNITED STATES PATENT OFFICE.

J. C. ROBIE, OF BINGHAMTON, NEW YORK.

## ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 1,862, dated November 26, 1840.

*To all whom it may concern:*

Be it known that I, J. C. ROBIE, of Binghamton, in the county of Broome and State of New York, have invented an Improvement in the Manner of Constructing Rotary Steam-Engines; and I do hereby declare that the following is a full and exact description thereof.

My engine in its general construction, is similar to some other rotary engines which have been heretofore made, my improvements consisting in certain devices by means of which the friction is lessened, the waste of steam is prevented, and the valves against which the steam acts, are so constructed and arranged as to open against permanent bearings, so that their action is more perfect, and their liability to derangement much less, than such as have been heretofore constructed.

Figure 1, in the accompanying drawing, represents my engine, in perspective. Fig. 2, is a view of the interior, consisting, mainly, of a revolving drum and piston, and the valves against which the steam is to operate, the circular plate, Fig. 3, being removed for the purpose of exhibiting these parts. Fig. 4, is a section through the revolving drum, and a part of the axis, or shaft, upon which it is fixed.

A, Figs. 1 and 2, is the rim, or periphery, of a stationary drum, within which the revolving drum, and piston are contained.

B, B, is the axis upon the middle, or hub, of which the revolving drum is affixed; C, C, being its bearings, and D, a band wheel by means of which the power may be conveyed wherever it is wanted. The axle B, B, may be made hollow for the induction of steam at one end, and its escape at the other, a solid division being left in the center of the shaft to separate the two channels from each other. In general, however, I make these induction and eduction openings to a short distance only along the hub, or part of the shaft upon which the revolving drum is fixed, and admit the entrance and escape of the steam laterally, and I have in the drawings shown it as so constructed.

E, Fig. 1, is an induction pipe entering a stuffing box F, attached to the stationary drum, there being a cock, or valve, at *a*, to govern the admission of steam.

G, is the eduction, or escape, pipe, entering a stuffing box F'. To lubricate the hub,

and other parts, I employ two oil tubes H, H, governed by cocks *b*, *b*.

I, is the movable head of the stationary drum.

In Fig. 2, J, J, is the revolving drum, attached to the hub K, of the axle B; which drum is of such size as to leave a channel, or space, L, L, between its periphery, and the interior of the rim A, of the stationary drum. The drum J, widens out at the part J'', so as to constitute a piston, which exactly fills the space, or channel, L, L. It is necessary that the revolving drum J, should exactly fill the space between the two heads of the stationary drum, so as to be steam-tight, and yet to revolve freely, a desideratum which I accomplish in the following manner, and which device constitutes one of my improvements. On each side of the drum J, I place two annular plates J', Figs. 2, and 4, covering it from its outer edge, and extending inward, say to the line *c*. These plates have a fillet at their outer edges, which embrace, and fit exactly on to, the periphery of the drum, as shown at *d*, *d*, in the section, Fig. 4; and the projecting edges of these fillets are beveled, in the manner represented. The steam bearing against these beveled edges will force the plates J', into close contact with the heads of the stationary drum, and render the juncture steam tight. Should the bevel be allowed to rise too high, the pressure of steam will become too great, but this is easily graduated. I widen these plates out at J'', so as to cover the revolving piston on each of its sides. This forms a perfect packing on each side; and the edge, or rim, of the piston J'', may be furnished with an elastic, metallic packing, or any suitable elastic material may be used, in any of the known ways of packing this part.

The valves which I employ for the steam to act against in the channel L, L, are similar, in most respects, to such as have been heretofore used, but they are sustained in a more efficient manner. One of these valves is shown as open at *e*, and the other as closed at *e'*. They work on joint pins in the heads of stationary drum, and they are made wider, say half or three fourths of an inch, than the depth of the channel L, between the said heads; and in each of these heads there is a recess, or depression, made to the depth of one half the extra width given to these valves, within which they

work, and which, when they are open, constitutes a bearing for their flat sides, as shown at *f, f*, Fig. 3. They are not dependent, therefore, upon the fitting of their edges  
5 to render them steam-tight at that part. The outer ends of these valves must be made to correspond in form with that of the periphery of the drum *J*, and may be armed with elastic packing, in any manner preferred.  
10 When shut back within the rim *A*, they fit exactly in place; to cause them to open to a small distance, when freed from the action of the piston, I place a spring *h*, within the recess, behind them. I make the  
15 edge of the piston *J''*, longer than it has heretofore been made, so as to cover the valve, and a considerable surface beyond it, by which means any packing employed is rendered more durable. I perforate the drum  
20 *J*, with several holes, passing from side to side, as at *g, g*, in order that any steam which may accidentally find its way between the revolving and the stationary drums may have a free passage from one  
25 side to the other, and produce an equal pressure, a device which I have found to be of much use. The valves are closed in the ordinary manner by the sloping part *i* of the piston *J''*; and in opening they are  
30 eased down by a sloping strip of metal *o*, causing them to work without noise or injury.

In the operation of this machine, the steam which enters by the pipe *E*, passes

through the corresponding opening in the  
35 hub, to the channel through the revolving drum, represented by the dotted lines *k, k*, and after having performed its office, it finds its way to the eduction pipe through a  
40 perforation represented by the dotted lines *l, l*, which operation being similar to that of other known rotary engines it is unnecessary further to describe.

Having thus fully described the manner in which I construct my rotary steam engine what I claim therein, and desire to secure by Letters Patent, is—

1. The manner of packing the sides of the revolving drum, by means of the annular  
50 plates *J', J'*, embracing its edges, and otherwise constructed and operating as set forth.

2. I also claim the forming of recesses within the heads of the stationary drum, to receive and sustain the projecting edges of  
55 the valves, as described.

The other parts of the within described machine I do not claim, they being, in general, substantially the same as have been before known and used.

In testimony that the foregoing is a true  
60 and exact specification of my invention, I have hereunto subscribed my name, in the presence of two witnesses, this first day of June, 1840.

JACOB C. ROBIE.

Witnesses:

THOS. P. JONES,  
GEORGE WATT.