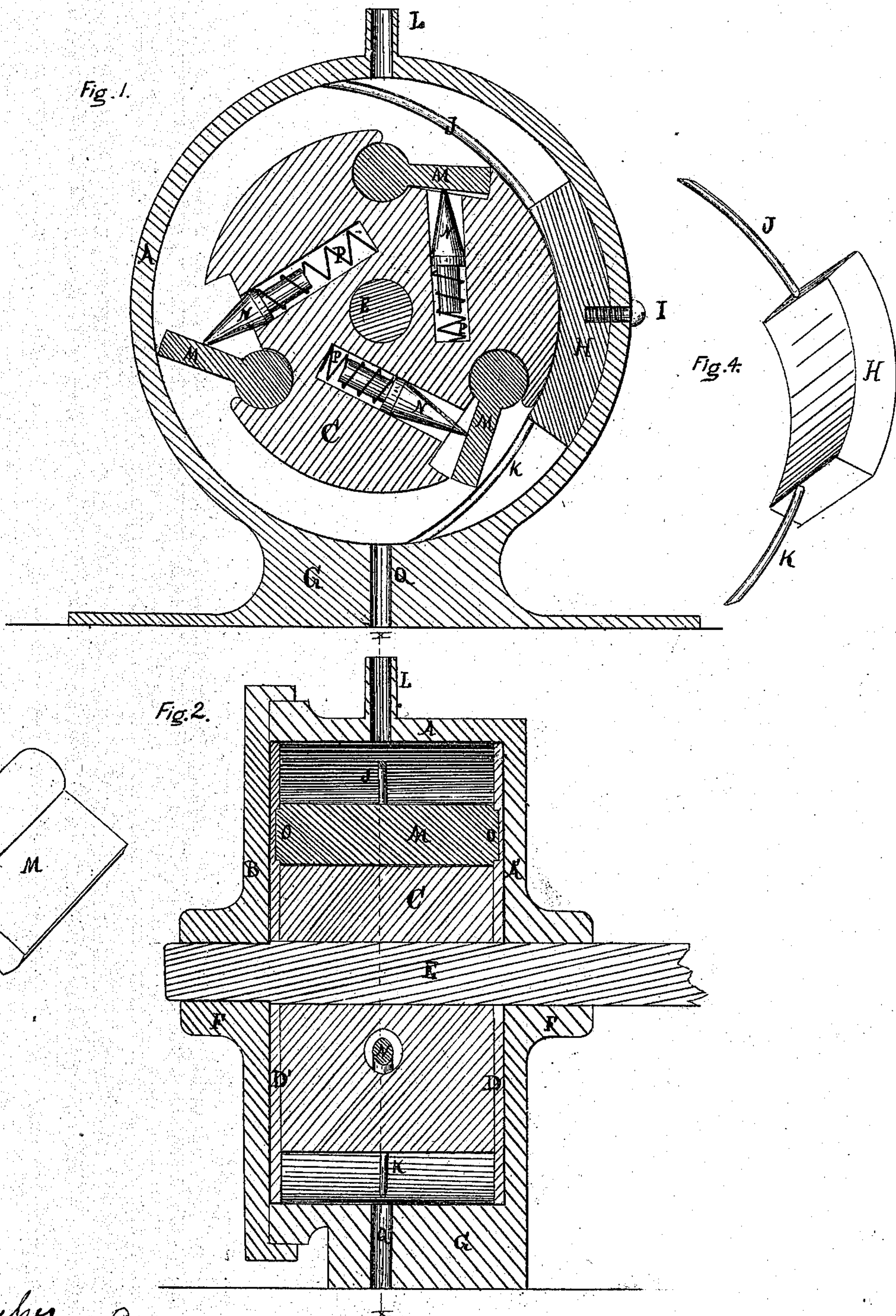


W. M. FULLER.  
ROTARY ENGINE.

No. 105,796.

Patented July 26, 1870.



Witnesses  
 Phil. S. Dodge  
 L. Hailer.

Willard M. Fuller  
 Inventor.  
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 his attys.



# United States Patent Office.

WILLARD M. FULLER, OF NEW YORK, N. Y.

Letters Patent No. 105,796, dated July 26, 1870.

## IMPROVEMENT IN ROTARY ENGINES.

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

To all whom it may concern:

Be it known that I, WILLARD M. FULLER, of the city and county of New York and State of New York, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification, reference being had to the accompanying drawing making a part thereof, in which—

Figure 1 represents a vertical section.

Figure 2, a transverse vertical section.

Figures 3, 4, and 5, views of details detached.

Like letters refer to the same parts in all of the figures.

The nature of my invention relates to that class of rotary steam-engines which has folding wings or pistons; and

Its nature consists in an improved mode of hanging the wings and supporting them; in an improved mode of constructing the inclines which guide the wings in opening; and in a novel combination and arrangement of the parts.

To enable others skilled in the art to make and use my improved machine, I will describe its construction and operation.

In the drawing—

A represents the outer case or cylinder;

A' and B, the ends or heads;

C, the interior cylinder or case, provided with suitable recesses for the folding of the wings;

D and D', end-plates or disks fitting the interior diameter of the case A, and attached to the cylinder C;

E, the shaft;

F, journal-bearings for the shaft, which may be provided with stuffing-boxes;

G, a base or frame, suitable for the support of the case;

H, a segment or cut-off, fitting the inner cylinder C, its entire inner surface;

I, a bolt, for fastening it to the case;

J, a rod or bar, curved and inclined from the inner edge of the segment to the case, for making the wings open gradually;

K, a similar rod or bar, for folding the wings;

L, a steam-pipe;

Q, an exhaust-pipe;

M, the folding wings or pistons;

O, journal at the ends of the wings; and

N P, springs.

In practice, I have found that three wings answer the best purpose, and I make them wide enough to stand at a tangent, as shown, when new, so that they will continue to be effective as they wear away.

The hubs or cylindrical portions of these wings fit loosely in the cavities of the cylinder C, and they have their bearings in the disks D by means of the ends O.

The pressure against the piston makes it fit against one shoulder of its socket or cavity, so that it is sufficiently steam-tight there, with but little friction, and, by the use of the disks D, there is but little friction upon the ends of the pistons, none in fact, except from the movement of the pistons when folding or opening, and consequently no perceptible wear.

The best proportions for making the segment or cut-off H, with its inclines, is to make the segment equal in length to one-sixth of the circumference of the case, so that it will be longer than the recess for the piston, and thereby prevent the escape of steam, and endure great wear, and each of the bars J and K one-half longer, or equal to one-fourth of the circumference. When the engine runs only in one direction, the bar or incline K may be shortened.

By the use of the bar J, the steam is permitted to enter behind the piston as soon as it commences to open, thus holding it up against the pressure of the inflowing steam as it passes the opening L, equalizing the pressure, thereby avoiding the sudden and violent beating of the piston against the case.

By the use of a long segment or cut-off, the end plates or disks D and the wings made wider than the space between the two cylinders, I avoid all packing, which is one of the chief merits of my machine.

The spring may be made as shown, or in any other desired form, as its principal function is to start the wing, so as to insure its opening.

Having thus fully described my improved machine,

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

1. The folding wings or pistons M, when provided with journals O, bearing in the disks, in combination with the disks D and D' and the cylinder C, substantially as specified.

2. The incline bar J, in combination with the long segment or cut-off H, when constructed and operating substantially as and for the purposes described.

3. The combination and arrangement of the case A B, cylinder C, wings M, springs P, plates or disks D, and segment H, provided with the bar J, with suitable steam and exhaust-pipes, substantially as specified.

WILLARD M. FULLER.

Witnesses:

WM. H. SMITH,

A. H. NONES,