

ROBERT HUGHES.

Improvement in Rotary-Engines.

No. 114,685.

Patented May 9, 1871.

Fig. 1.

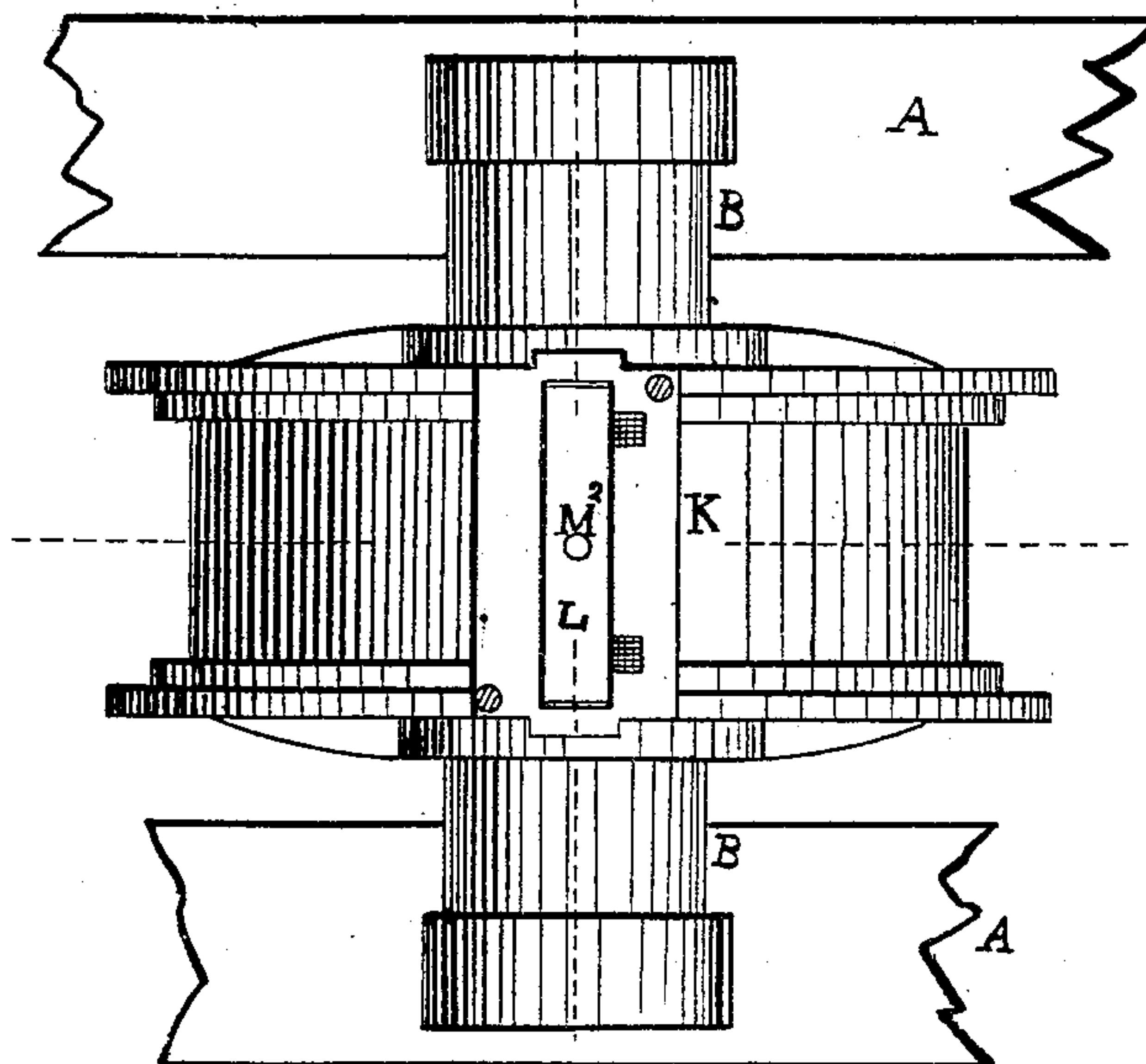


Fig. 3.

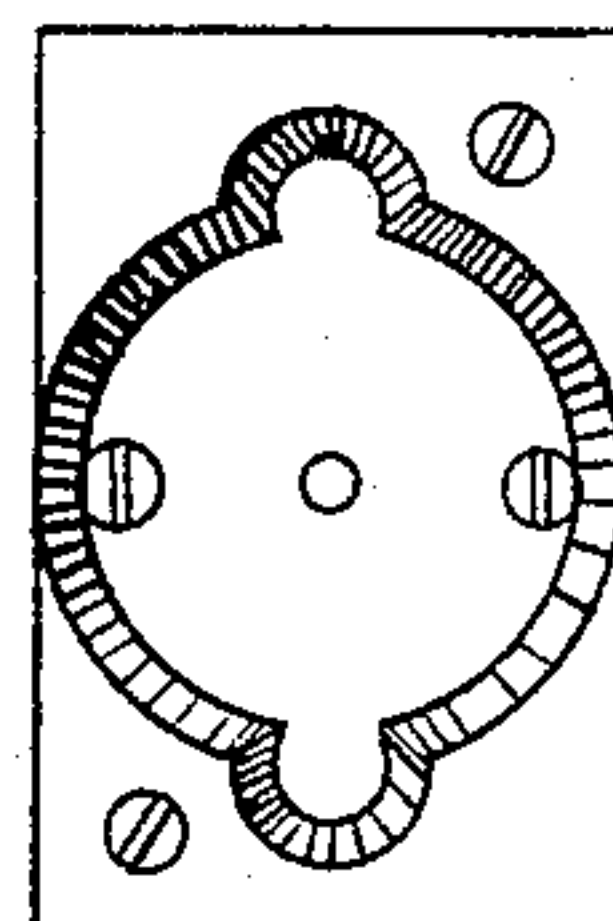


Fig. 4.

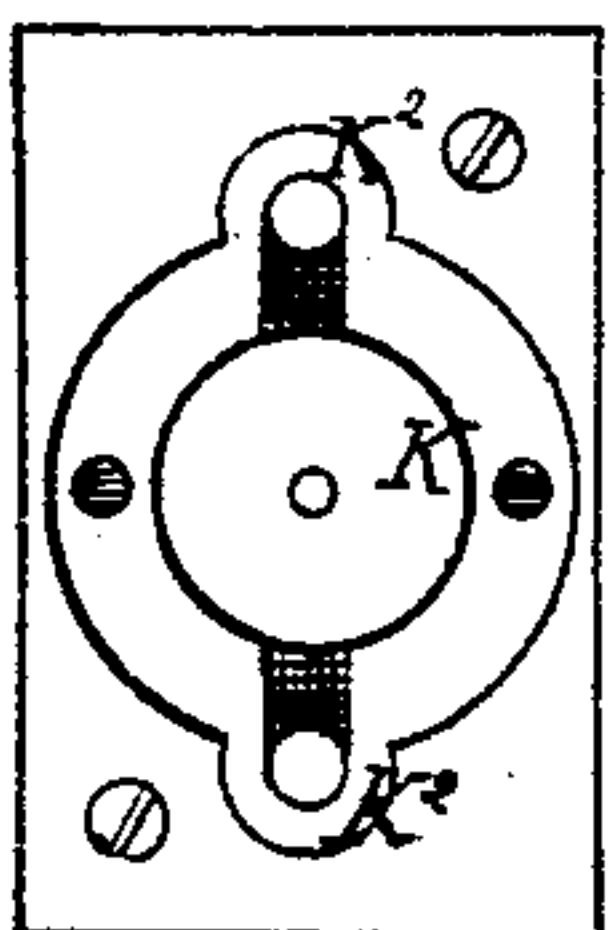
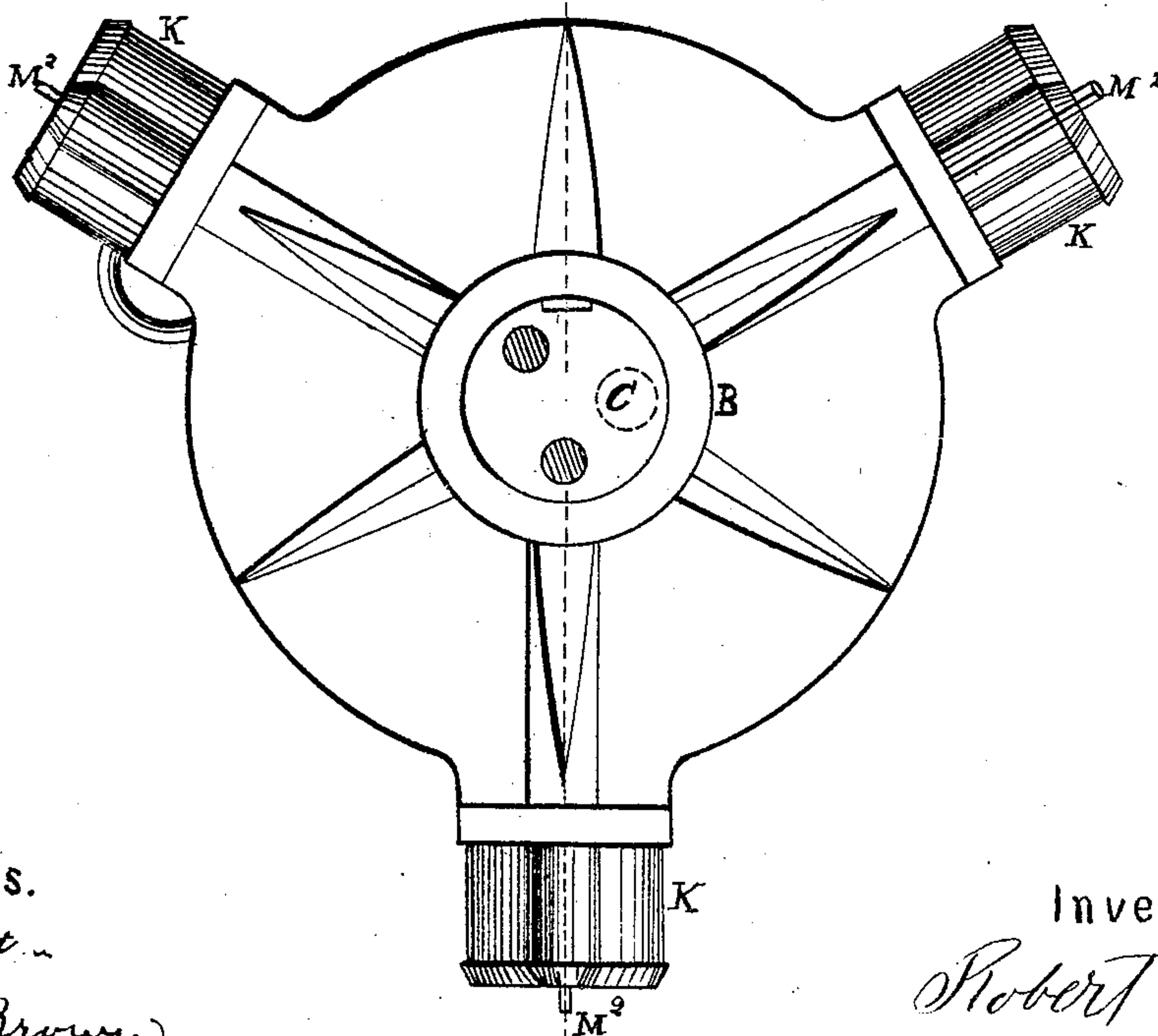


Fig. 2.



Witnesses.

J. F. Reigart

Edm. F. Brown

Inventor.

Robert Hughes

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Fig. 5.

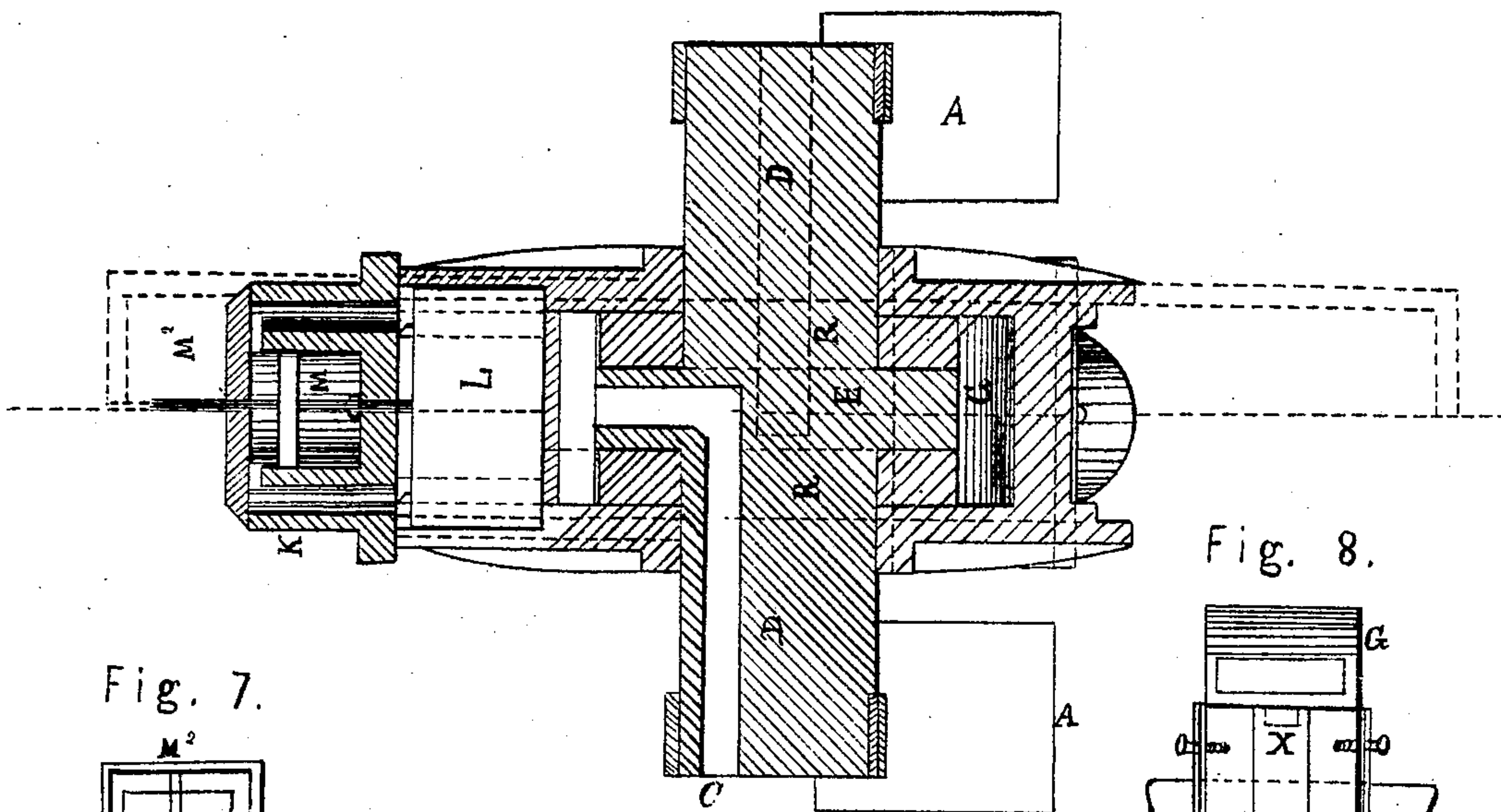


Fig. 7.

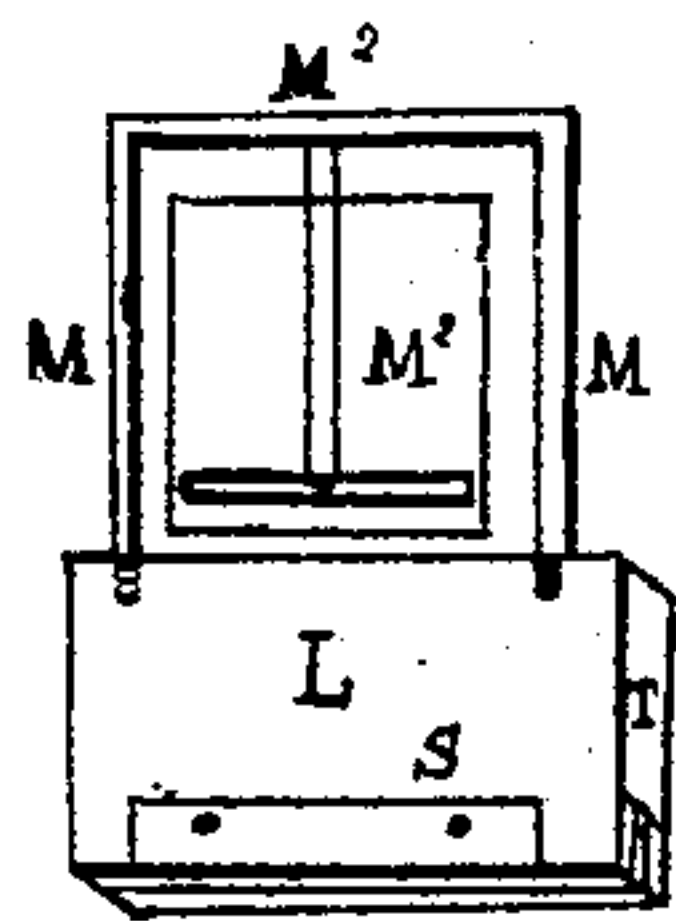
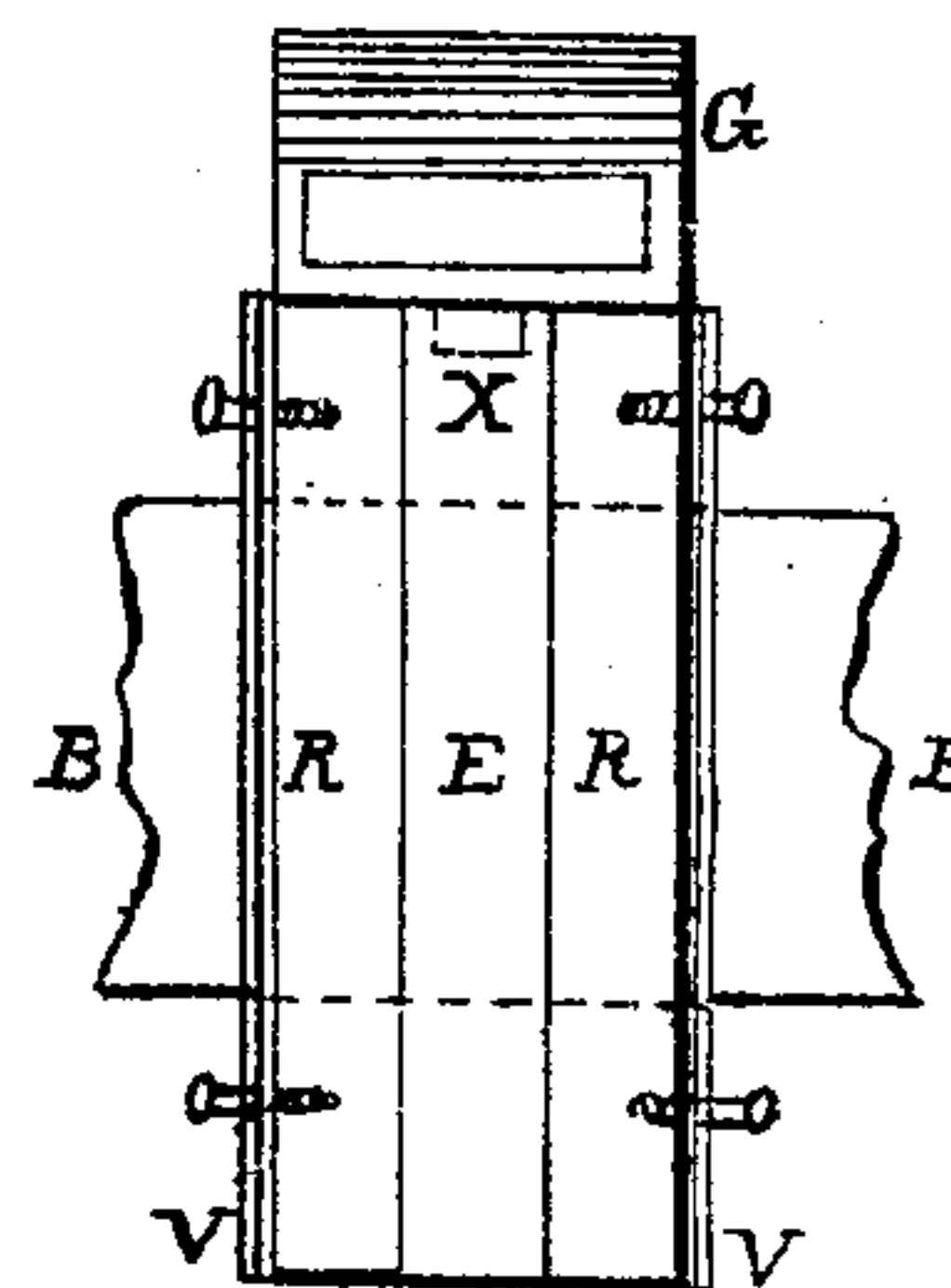


Fig. 8.



Witnesses.

J. F. Regart -

Edm. F. Brown.

Inventor.

Robert Hughes

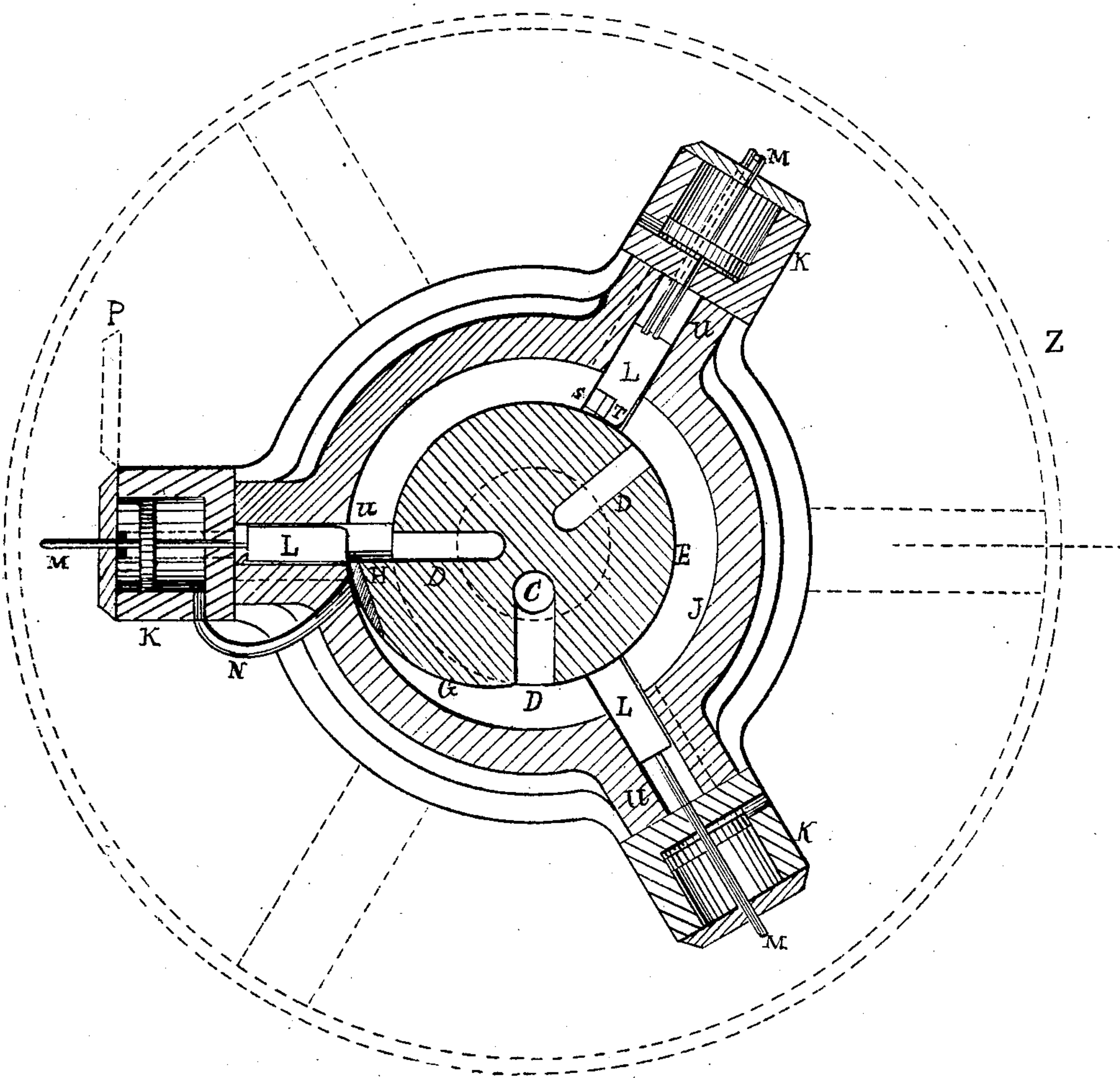
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Fig. 6.



Witnesses.

S. F. Reigart
Edw. F. Brown

Inventor.

Robert Hughes

United States Patent Office.

ROBERT HUGHES, OF DANGERFIELD, TEXAS.

Letters Patent No. 114,685, dated May 9, 1871.

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, ROBERT HUGHES, of Dangerfield, Titus county, State of Texas, have invented new and useful Improvements on Rotary Engines; and I do hereby declare the following to be an exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification, in which—

Figure 1, plate 1, represents a top view of the rotary engine.

Figure 2, a side elevation of the same.

Figure 3 represents the bottom plate of steam-chest.

Figure 4 shows a top view of the steam-chest with its cylinder and steam-channels.

Figure 5 represents a cross-section of the engine.

Figure 6 represents a vertical section of the engine.

Figure 7 shows the valve with its double pitman-rods connected by a cross-beam to the piston.

Figure 8 shows the stationary head with its packing-rings.

The nature of my invention consists (as additional improvements to my patent of June 5, 1866) in the arrangement and combination of a double pitman-rod with the valve, and the valve-cylinders with their channels, the valve-box with its channels; also, steel plates on the valve with a cushion between the valve and the plates; also, the outside pipe leading from the engine to the steam-chest, when used as a pump.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, as follows:

I intend to rest my rotary engine on a suitable and properly-constructed frame or foundation.

A represents a frame or support for the engine.

B, the stationary axis, in which the steam enters at one end and escapes at the opposite end at C, through the channel D.

E is the stationary center-head, which is located permanently on the stationary axle B, the head being circular with a curved or cam-point, G, projecting in a curve from the periphery of the head, that may either be solid with the center E, or attached by being firmly fitted to it by screws, the point at H being the packing to fit the circle or concave side of the revolving cylinder J.

I have three or more valve-cylinders, K, and a pitman-rod, M, on each side of the valve-box, connected or bent as a cross-beam at top, having a center or piston-rod, M², that is attached to a circular plate, L, operating as a lever in the cylinder K.

N represents the pipe on the outside, connected with the interior of cylinder J and the valve-cylinder

K, when used as a pump, at the inside of the piston, combined therein, so that it is connected with the vacuum side of the cylinder J, and produces, at the same time, a vacuum on the under side of the piston.

The top of the cylinder K, as shown by the dotted lines P, being removed, allows the piston to be operated by the atmosphere on the outside, forcing it down, and forcing the valve L down to the lower side of the cylinder, thus holding the valve down until the escapement passes it; then the pressure of the water forces through the pipe N and under the piston, which raises the piston, carrying the valve out with it.

On each side of the center-head E I have a packing-ring, R, made of iron or any other suitable material, which packing-rings extend into the side plates of the steam-cylinder in a recess, which recess extends into the sides of the plates beyond the valve-guides U.

In said recesses is another thin ring, V, with ordinary packing between it and the main ring R, that is compressed by screws, W, passing from the outside of the cylinder-plates through the thin ring V and the packing and into the ring R, the screws having a shoulder on at ring V.

So as to prevent the steam from escaping over the rings into the back of the recess, or through the valve-guides u, or out through the holes for the screws, and to prevent the steam from escaping between the center-head E and the packing-rings, I intend having a spring pressure from the outside cylinder-plates.

The valves L have steel plates, S, on each side of their lower ends, with a cushion, T, between, for the purpose of making a tight fit upon the convex side of the cylinder.

In operating my engine the steam enters the axis B and passes into the cylinder E through the channel X in front of the cam at H, and acts upon the next valve L in front of it, driving the cylinder around until the succeeding valve falls in front of the head. After one valve has passed, say, one-third the circumference of the cylinder, the next valve takes its place and operates the same as the former.

I may have two or more cylinder-heads, with two or more valves to each cylinder-head, and, as the one valve passes the first escapement, the steam is then forced out by expansion from between those valves through the hollow axis, or in any other direction I may desire it, into another engine, thus utilizing the steam; and a condenser can be used with these engines in connection with the escapement and forming the vacuum on the back side of the valve.

To reverse the motion of my engine I merely change the feed-channel to the opposite side of the cylinder-head, that the operator may close one feed-

channel and open the other at pleasure, so that the steam will act against the other side of the cam or abutment, the escapement being changed on the center-head to the point immediately opposite the point at H of the cylinder-head, making it common for both sides.

The circular dotted lines Z represent a band or cog-wheel that is intended to be attached.

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

1. A double pitman-rod M, as combined with the

valve L and piston M², and operating as herein described.

2. The valve-cylinders K, when arranged with the valve-box and pitman-rods M, and operating as herein described.

3. The outside pipe N, when connected and combined with the cylinder E and valve-cylinder K, as described, and for the purposes set forth.

Witnesses:

ROBERT HUGHES.

W. E. PENN,

J. A. HINNANT.