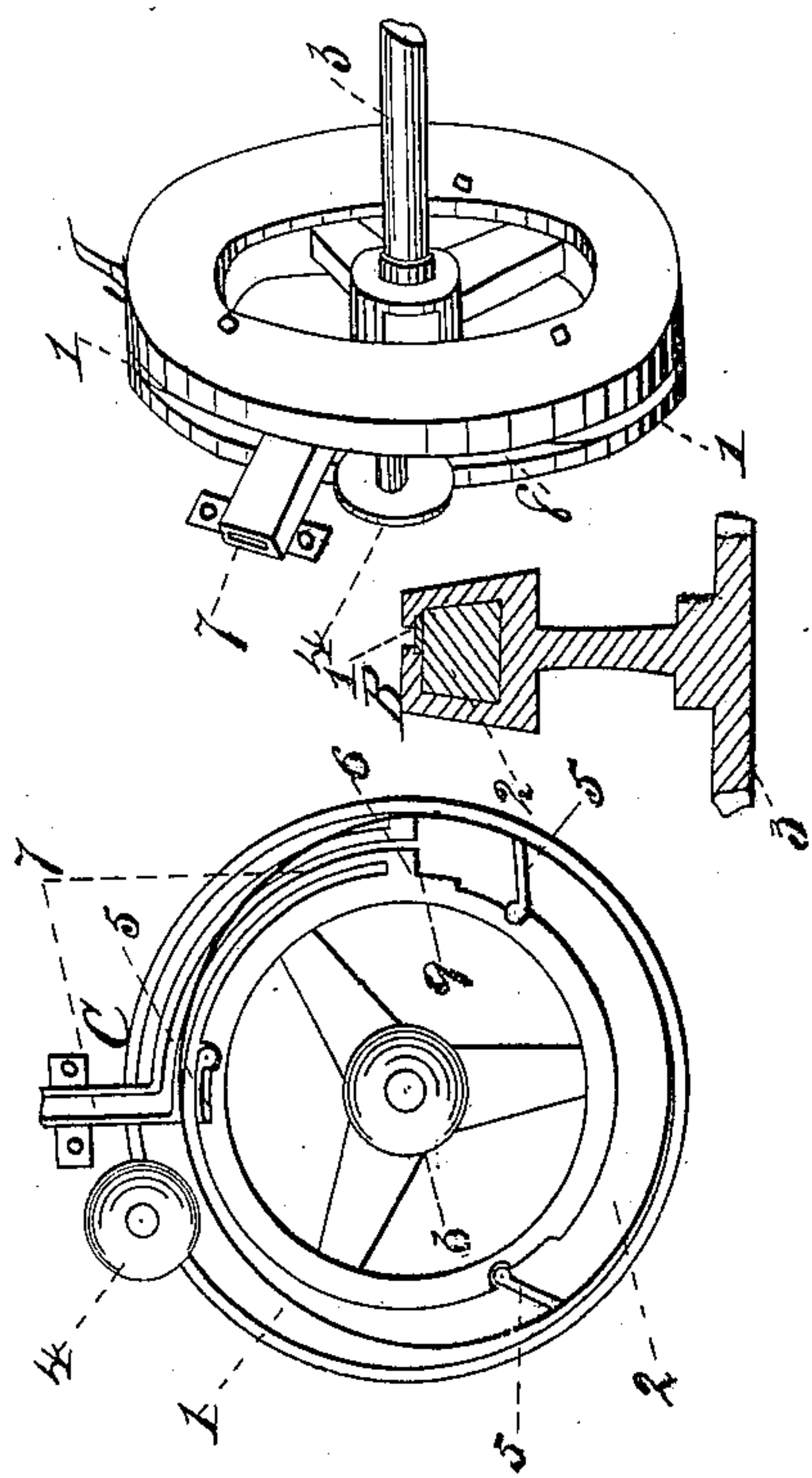


R. F. Sterens,
Rotary Steam Engine.
No. 4,545. Patented May 30, 1846.



UNITED STATES PATENT OFFICE.

RICHARD F. STEVENS, OF ST. LOUIS, MISSOURI.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 4,545, dated May 30, 1846.

To all whom it may concern:

Be it known that I, RICHARD FIELD STEVENS, of the city of St. Louis, and State of Missouri, have invented a new and useful mode of confining steam or other fluid agent within a hollow or chamber extending throughout the circumference of a wheel, for the purpose of obtaining therefrom a constant rotary motion; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same.

The nature of my invention consists in providing an aperture or opening 8 extending throughout the circumference of a wheel A, and communicating with a hollow or chamber 2 within, with a flexible hoop, ring or band 1, which may be so applied to the said opening as to confine steam, or other moving agent, within the hollow of the wheel, in order that its power may be communicated directly to the periphery of the wheel.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation. I construct a wheel A with a hollow or chamber 2 extending throughout its circumference, which chamber may be made of any convenient form or dimensions, and make an opening 8 of suitable width extending entirely around the wheel A, and communicating with the chamber 2 within said opening 8 being made for the purpose of admitting a piston rod 7 into the chamber 2; I then construct a piston 6, the form of which is made to correspond with the form of the chamber 2. To this piston 6 I attach a hollow piston-rod 7, which is curved so as to correspond with the curve of the chamber 2. At a point about $\frac{1}{4}$ of the circumference of the wheel A distant from the piston 6, the rod is so bent as to pass out of the chamber 2 and through the above mentioned opening 8; and being made fast without the wheel, it makes a firm support for the piston 6; I make an opening 9 through the piston, which corresponds with the hollow extending through the piston-rod 7. I then construct a flexible hoop, ring, or band 1 the width of which is made greater than the opening 8 in the wheel.

I make the edges or sides of the band 1 beveling, so that its inner surface is wider than its outer surface. I make the sides of the opening 8 in the wheel beveling also, so as to correspond with the beveled sides of

the band 1. The diameter of the band 1 I make less than the diameter of the opening 8 in the wheel. By compressing the band 1 upon one side, after it has been placed in the chamber 2, it fits into the opening 8 upon the opposite side, thereby closing it, its inner surface corresponding with the inner surface of the chamber. I then attach two, three, or more valves to the wheel at equal distances from each other, which are made to shut across the chamber, thereby dividing the chamber 2 into separate apartments.

The operation of the machine is as follows: The piston 6 is made stationary by making the rod 7 fast without the wheel A; the steam or moving agent passes through the piston-rod 7 and piston 6 into the chamber 2, and by operating against one of the valves 5, which is shut across the chamber 2 it forces the wheel A around until another valve 5 has passed the piston 6 and shuts across the chamber 2, when the former 5 is withdrawn and the moving agent allowed to escape. The band 1 is held in the opening 8 by the piston 6, by the moving agent tending to force it outward, and by the valve 5. About one third or one half of the opening 8 is thus closed by the band 1, and the remaining part is left open for the admission of the piston-rod 7. The band 1 is carried around by the wheel A, and constantly operating so that the opening 8 is clear on one side of the wheel A, and constantly closed upon the opposite side.

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

The application of a flexible hoop, ring or band 1 to an opening 8 communicating with a hollow or chamber 2 in the rim of a wheel A, in such a manner as to close the opening 8 in a part of its circumference and leaving it open in the remainder, thereby allowing a communication with the chamber 2 upon one side of the wheel A, while the opposite side is closed, and the moving agent confined in such a manner that its power is expended directly and constantly upon the periphery of the wheel A. The said hoop or band 1 may be made of any flexible substance; may be made continuous or jointed; or a part only of the hoop or ring 1 may be used, and applied to the opening 8 in the same manner as a portion of the continuous hoop or ring 1 above described. The hoop or ring 1 may be applied to either side of the

chamber 2 in such a manner as to produce the desired effect, operating as a circular valve.

My invention may be used on a rotary engine, which may be propelled by steam, air, or water, or any other fluid agent, for the purpose of propelling machinery; and it may also be used in a force pump, a fire

engine, or a suction pump. The moving agent may be admitted through the piston 6, 10 or through the sides of the chamber 2.

RICHARD FIELD STEVENS.

Witnesses:

H. W. DURNFORD,
LEMAN B. PITCHER.