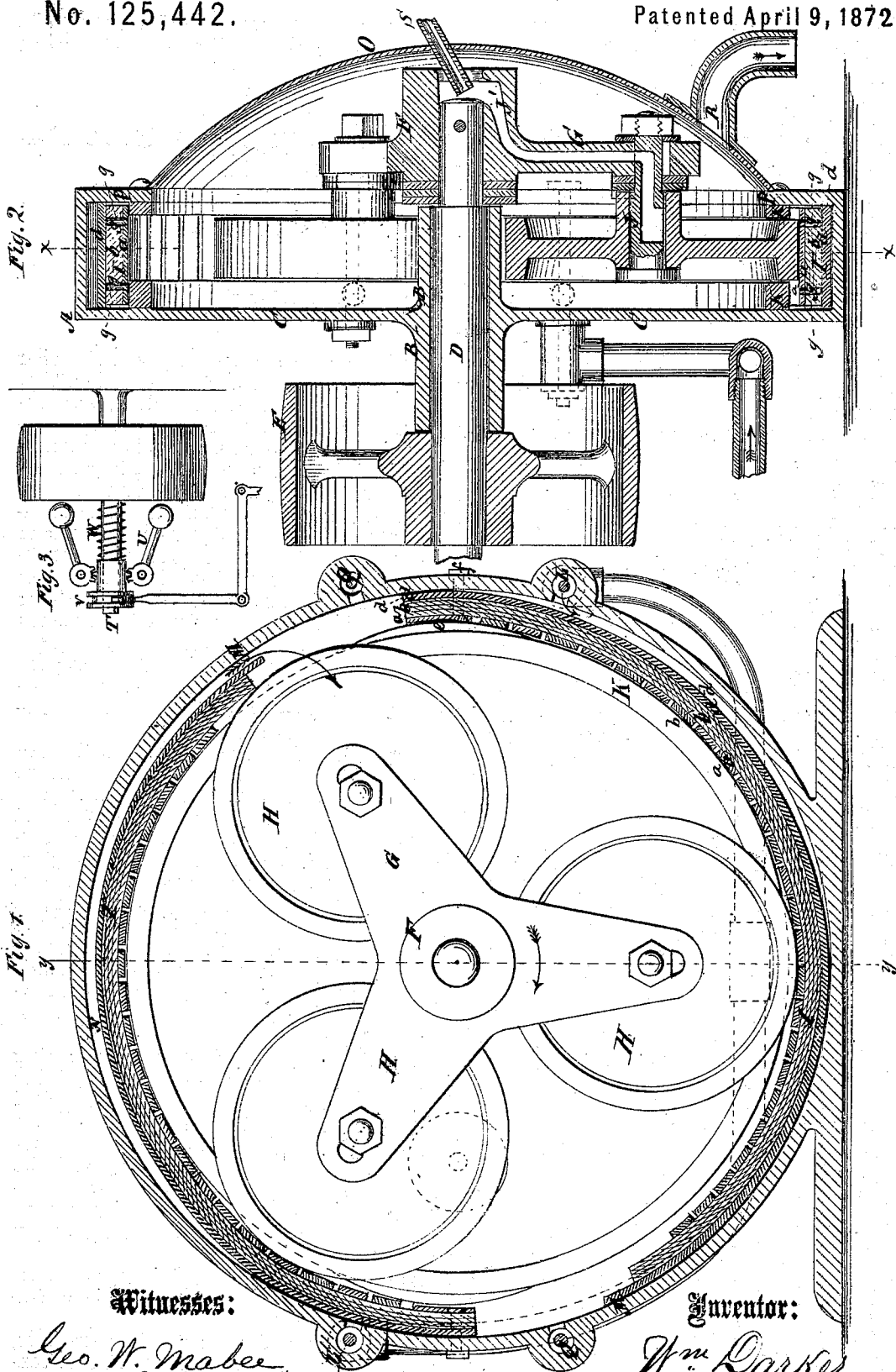


WILLIAM DARKER.  
Rotary Steam Engines.

No. 125,442.

Patented April 9, 1872.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WILLIAM DARKER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND JOSIAH D. THOMPSON, OF SAME PLACE.

## IMPROVEMENT IN ROTARY STEAM-ENGINES.

Specification forming part of Letters Patent No. 125,442, dated April 9, 1872.

Specification describing a new and Improved Rotary Steam-Engine, invented by WILLIAM DARKER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania.

The invention will first be fully described in connection with all that is necessary to a full understanding thereof, and then clearly pointed out in the claim.

Figure 1 is a sectional elevation of my improved engine on the line *xx* of Fig. 2. Fig. 2 is a section on the line *yy* of Fig. 1. Fig. 3 is an elevation showing the application of the governor.

Similar letters of reference indicate corresponding parts.

A is a hollow cylindrical stationary case of cast metal, with a tubular projection, B, projecting from each side of the side plate C, at the center, for the support of the shaft D, which at the outer end carries the driving-pulley E, and at the inner end the hub F and the radial arms G, on each of which is mounted a tread-wheel, H, which, in conjunction with the flexible devices I, confined steam-tight between the sides of the case, and vibrating between the inside of the periphery and the annular ribs K of the case, constitute the means of impelling the shaft around on its axis by steam admitted at the ports L, between the said flexible devices and the periphery of the case, and escaping at M into the space N, inclosed by the concave side O, covering a large central opening through the side P of the case, from which space it escapes by the exhaust-pipe R. These flexible devices are composed of the short metal bars *a*, backed with flexible vulcanized India-rubber packing *b*, or any equivalent thereof, the said bars being arranged transversely of the strips on the inside, and the strips extending around the case, with the periphery nearly half way, and being fastened at one end, just in advance of the steam-ports L, by the clamping pieces *c* and bolts *f*. The said plates have pins, *g*, passing through the inner strips *b*, of India-rubber, to keep them in place; said inner strips are of pure rubber, and fit snug and steam-tight against the polished sides of the chan-

nel, and the outer strip is composed of rubber and canvas, to prevent too much elasticity, and fits loosely. These flexible devices are depressed against the periphery of the case, steam-tight, in advance of the steam, which, forcing them back behind the wheels H, impel them forward and cause them to revolve on their own axes. The movement of these flexible devices is very slight, being only about a quarter of an inch, which, it is believed, will not injuriously affect the rubber, the integrity of which is preserved by the moisture of both the exhaust and the live steam, the former being diffused throughout the whole interior space of the engine. The idle ports Q are applied for running the engine in the opposite direction, which may be done, if desired, by reversing the flexible devices.

I propose, for the purpose of lubricating the axles of the wheels H copiously with water, to avoid the use of oil or tallow, which are injurious to rubber, to make the hub F, arms G, and the said axles J hollow, as shown by the passage J, and introduce water thereto by a pipe, S; and I propose to make a small extension, T, of the shaft D, when the engine is arranged in a horizontal plane, for the support of the arms U of a governor, and combine therewith the annularly-grooved slide V and a coiled spring, W, as shown, whereby I provide a governor in a very simple and inexpensive manner.

I do not confine myself to the case being stationary, and the tread-wheels swinging around the axis of the main-shaft; nor do I confine myself to the flexible devices, and the tread-wheels being inside the case, because the hub F may be made stationary, and the case to revolve around it, and the flexible devices and the wheels may be arranged upon the outside of the periphery of the case, upon the same general plan.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The packing for rotary steam-engines, composed of loose outer strip of rubber can-

vas, *d*, the rubber strips *b*, and the metallic bars *a*, combined, arranged, and applied as and for the purpose described.

2. The pieces *e*, pins *f*, and bolts *g*, combined with the sections of packing to hold them together in the manner described.

3. A main shaft, *D*, provided with exten-

sion *T*, combined with the grooved slide *V* and coiled spring *W*, as and for the purpose described.

WILLIAM DARKER.

Witnesses:

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