

W. B. Leachman,

Patented Dec. 22, 1868.

№ 85,106.



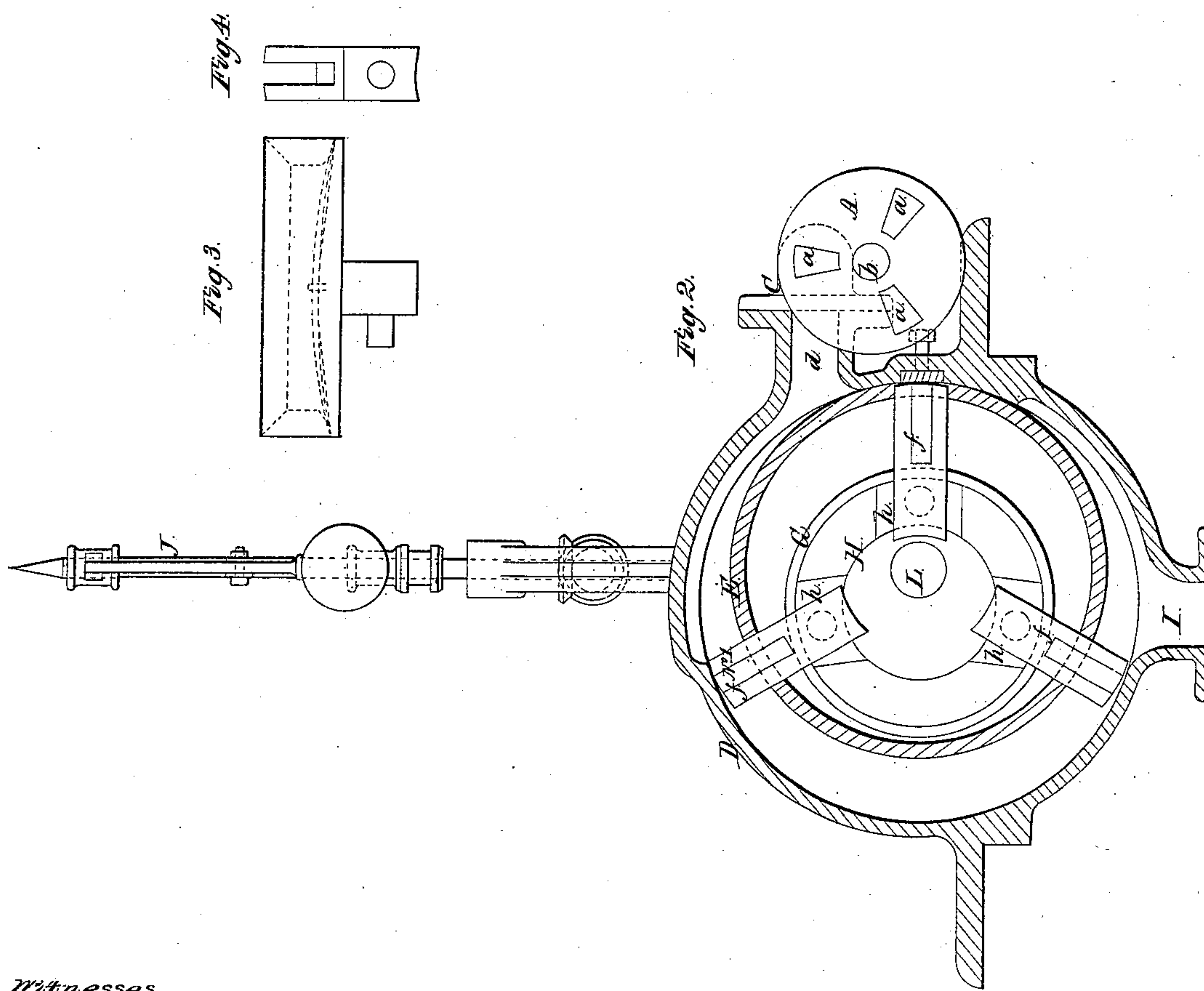
P. H. Sharp
H. Palmer.

William Bradshaw Leachman.

2 Sheets-Sheet 2.

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Rotary Steam Engine.
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No 85,106.



Witnesses.

P. H. Sharp
H. B. Leachman

Inventor.

William Bradshaw Leachman

United States Patent Office.

WILLIAM BRADSHAW LEACHMAN, OF LEEDS, ENGLAND.

Letters Patent No. 85,106, dated December 22, 1868.

IMPROVED ROTARY STEAM-ENGINE.

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

To all to whom it may concern:

Be it known that I, WILLIAM BRADSHAW LEACHMAN, of Leeds, in the county of York, England, engineer; a subject of the Queen of Great Britain, have invented or discovered an "Improved Rotary Water or Steam-Motive-Power Engine;" and I, the said WILLIAM BRADSHAW LEACHMAN, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof; that is to say—

Through the sides or ends of a cylinder of suitable dimensions I pass a shaft.

Upon this shaft, and within the said cylinder, I mount another smaller cylinder, provided with three recesses, and placed eccentrically with regard to the outer cylinder, the inner and outer cylinders touching in one portion of their respective circumferences, leaving, on the opposite side, a space.

I also cast to the inner surface of one end of the outer cylinder a double ring or internal eccentric, which is concentric with the outer cylinder or casing itself, but not with the shaft which passes through it.

Within this double ring, three slide-blocks are free to move, and with them are connected three bars, (by means of fast studs,) which extend across the diameter of the cylinder, and pass respectively through slot-holes in the surface of the inner cylinder.

To each of these bars is attached a feather or float, extending the whole width of the cylinder.

I may here add that the pins by which the bars are connected to the slide-blocks admit of the floats, along with the bars to which they are attached, receding from the centre of the shaft as they are urged by the eccentric.

The cylinder is provided with ports, placed opposite to each other, for the admission and emission of steam or water, whichever may be used.

Admitting steam, for instance, at the upper side, it passes between the two cylinders, until it reaches one of the floats, before spoken of, which, presenting a surface of resistance, is driven round, and, as it approaches the upper portion of the outer cylinder, gradually withdraws towards the centre, by means of the eccentric arrangement before named. The float now reaches the ejection-port, at which the steam passes out of the cylinder, the preceding feather or float meantime reaching the admission-port, for a fresh charge, and, as the first float comes round to its first position, it is gradually drawn closer and closer toward the centre, until it reaches that part where the two cylinders touch each other. Passing that point, as it approaches the steam-port, the eccentric-ring on the outer cylinder gradually urges it out, and the operation is repeated.

In some instances, however, I prefer to admit the steam where the inner and outer cylinders come in

contact, admitting such steam through a slide-valve, circular in its formation, and provided with three ports, as will be explained in the description of drawings.

I also use gearing to rotate the shaft upon which the valve is keyed.

I use an ordinary throttle-valve and governor-apparatus, which may also be worked in the manner usual in ordinary engines.

In order, however, that my invention may be the better understood, reference is made to the accompanying sheet of drawings, and to the letters and figures marked thereon; that is to say:

Description of Drawings.

Figure 1 shows a side elevation of the engine, with the adjuncts of throttle-valve and governor, before referred to, and

Figure 2, a section of the engine;

Figure 3 being a detail, which shows the formation of the floats.

Referring to fig. 2, letter A shows the circular valve, with the three ports, *a a a*.

Letters B, fig. 1, denote the gearing by which such valve, keyed on the shaft *b*, receives the requisite motion, for the purposes of admission of steam, where steam is used.

It will be apparent that, upon the steam entering, through the junction-pipe C, into the pipe *d* of the cylinder D, it will come in contact, after passing up the recess between the outer cylinder, D, and the inner cylinder, E, with the float *f*, No. 1, and give the result previously named, the respective floats being urged inwards and outwards, in their circular rotation, by the action of the eccentrics, G and H, upon the respective bars, *h*, to which they are connected.

In the drawing, filed herewith, it will be seen that three floats *f* are provided, and consequently three ports *a*, to the valve, so that, as each float approaches the port *d*, one of the ports *a* is there ready to supply the steam, where steam is used, requisite to urge it round. As each float approaches the opening I, the steam is, of course, emitted, no resistance being offered to it.

The governor J and throttle-valve arrangement K, with the intermediate connection, being well understood, and their junction, through the pipe *k*, with the engine, it is unnecessary to describe further than to remark that such governor-arrangements are driven from the small pulley, *l*, on the shaft L, communicating, by means of a belt, with the pulley M.

Fig. 3 shows the float, with a spring and wedge-pieces, in dotted line,

Figure 4 showing an end view of the float so recessed.

It may here be observed that lining or packing-rings, adjusted by set-screws, are sometimes used, as shown in dotted lines in fig. 2, to save the wear of the ends of the casing.

Having now fully shown and described the nature of my invention, I wish it to be understood that what I claim as novel, and of my invention, is—

1. The combination and arrangement, with the outer cylinder, and its concentric double ring, and the inner eccentric-cylinder and shaft, of the slide blocks, which move in the recess formed by said double ring, the bars, pivoted to said blocks, and the vanes or floats, carried by said bar, in the manner described, whereby the vanes or floats are constantly retained in the desired position, not being allowed free action.

2. The arrangement, with the rotary engine, when

constructed as described, of the rotating valve, provided with a number of ports, corresponding to the number of vanes or floats within the steam-cylinder, so that steam may be admitted at any given point, and cut off, so as to work expansively as set forth.

WILLIAM BRADSHAW LEACHMAN.

Witnesses:

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