2 Sheets—Sheet 1.

# J. C. THOMAS.

## ROTARY ENGINE.

No. 186,771. Patented Jan. 30, 1877.

Fig: 1.

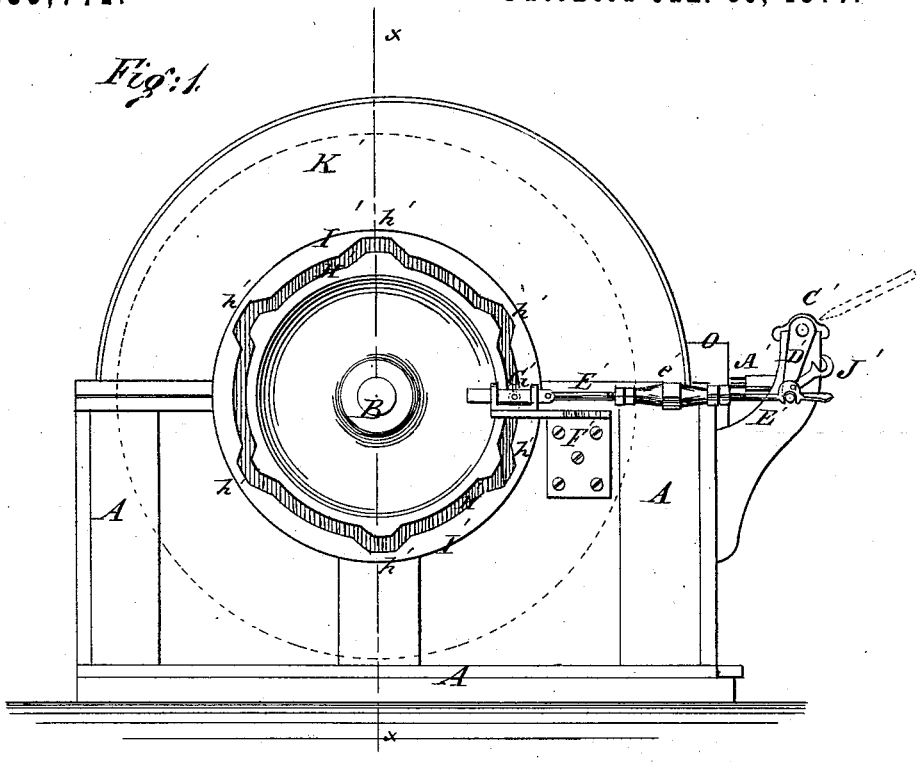
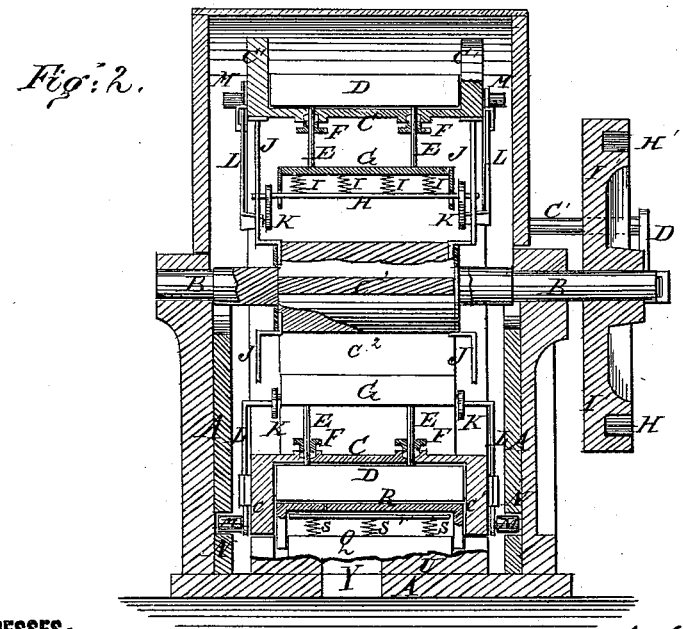



Fig: 2.




WITNESSES:

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INVENTOR:

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ATTORNEYS.

2 Sheets—Sheet 2.

# J. C. THOMAS.

## ROTARY ENGINE.

No. 186,771. Patented Jan. 30, 1877.

*Fig: 3.*

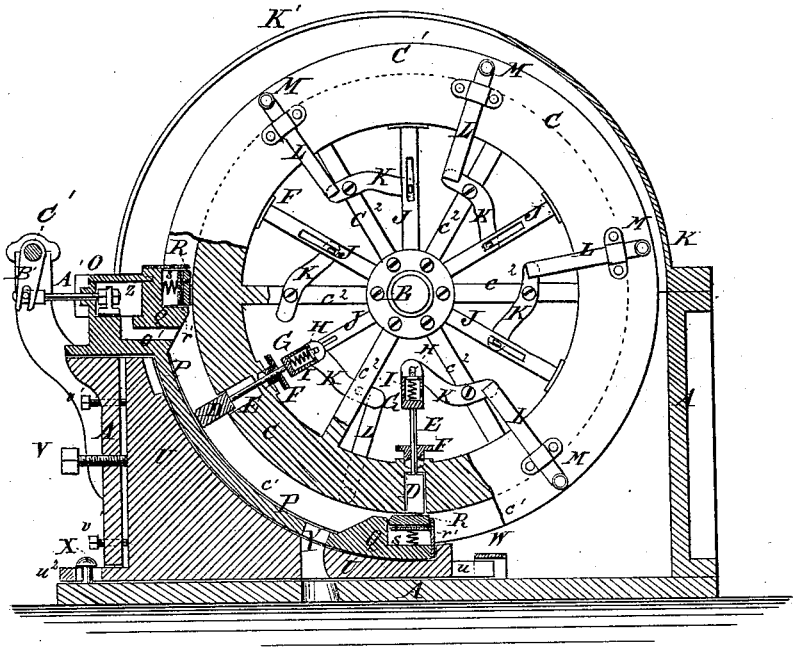


*Fig: 4.*

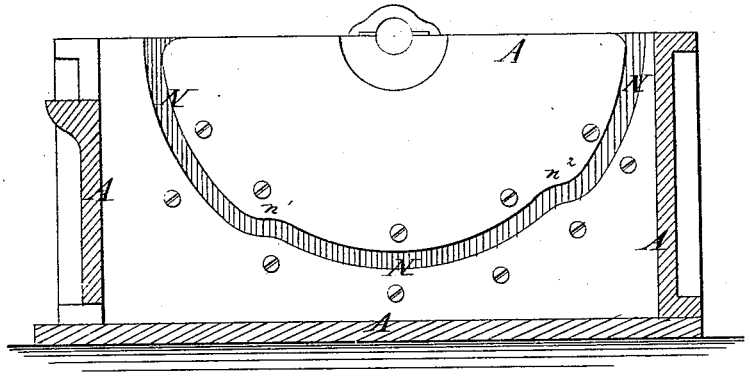


*Fig: 5.*

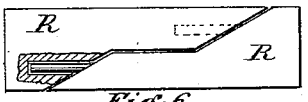
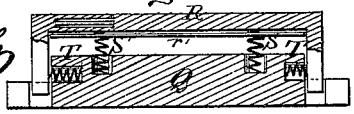


*Fig: 6.*



WITNESSES:

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

JOHN C. THOMAS, OF CARLINVILLE, ILLINOIS.

## IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **186,771**, dated January 30, 1877; application filed December 11, 1876.

*To all whom it may concern:*

Be it known that I, JOHN CHARLES THOMAS, of Carlinville, in the county of Macoupin and State of Illinois, have invented a new and useful Improvement in Steam-Wheel, of which the following is a specification:

Figure 1, Sheet 1, is a side view of my improved steam-wheel. Fig. 2, Sheet 1, is a vertical cross-section of the same, taken through the line *x x*, Fig. 1. Fig. 3, Sheet 2, is a vertical longitudinal section of the same, a part of the wheel being shown in side view. Fig. 4, Sheet 2, is a vertical longitudinal section of the lower part of the case, showing its groove. Fig. 5, Sheet 2, is a detail view of one of the brasses, part being broken away to show the construction. Fig. 6, Sheet 2, is a detail longitudinal section of the same.

Similar letters of reference indicate corresponding parts.

The invention relates to a steam-wheel or rotary engine; and it consists in the combination of the movable pistons, the rods, the spring-boxes, the slotted guides, the levers, and the slides, provided with the outwardly-projecting pins, with the flanged wheel and the grooved case; also, in the combination of the steam-chest, the segmental packing, provided with the abutments, the inlet-port and the outlet-port, and the adjustable block, with each other, and with the flanged wheel and the case, as hereinafter fully described.

A is the lower part of the case of the wheel, which is made rectangular in form, and in bearings in the upper parts of the sides of which revolve the journals of the shafts B. To the shaft B is attached the wheel C. The face of the wheel C has ring-flanges $c^1$ formed along its edges, making a wide, deep groove or channel upon it. The wheel is made with six or more arms, $c^2$, connecting its rim with its hub, and in its face, between its flanges $c^1$, and midway between its arms $c^2$, are formed deep transverse grooves, in which work the radial pistons D. To the inner edge of each of the pistons D are attached the outer ends of two or more rods, E, which pass through stuffing-boxes F, attached to the inner side of the rim of the wheel C, to prevent any steam from passing into the interior of the wheel C around the rods E. The inner ends of the rods E are attached to the outer sides of the boxes or hollow bars G, in the open inner sides of which are placed bars H, which are held out by springs I, placed in the said boxes G. The ends of the bars H pass through slots in the ends of the boxes G, which gives the pistons D a little play, while the springs I hold them all the time against the packing hereinafter described. The ends of the bars H enter guide-slots in the radial bars J, the outer ends of which are attached to the rim of the wheel C, and their inner ends are attached to the hub of the said wheel C. The ends of the bars H also pass through holes in the ends of the long arms of the levers K, which are pivoted to the side edges of the arms $c^2$ of the wheel C. To the ends of the short arms of the levers K are pivoted the inner ends of the bars L, which slide in keepers attached to the rim of the wheel C, and have outwardly-projecting pins M formed upon or attached to their outer ends. The pins M have friction sleeves or rollers placed upon them, to diminish the friction as the said pins move through their guide-slots. The pins M move through guide-slots N, made in the sides of the case A, and which are made with jogs or offsets $n^1$ $n^2$, to project the pistons D to receive steam, and to draw in said pistons at the exhaust-ports. O is the steam-chest, through a hole in the side of which the steam is admitted, and from which the steam passes to the wheel C through the inlet-port $o'$. The steam-chest O rests upon the upper edge of the case A, and is formed upon or secured to the upper end of the packing P. The packing P is curved upon the arc of the circumference of the wheel C, and has abutments Q upon its upper and lower ends of such a size as to fit into the space between the flanges $c^1$ of the wheel C. The inner sides of the abutments Q are inclined or beveled, and their faces are recessed to receive the brasses R, which are held out against the face of the wheel C by the springs S. The ends of the brasses R have arms formed upon them, projecting back at right angles across the ends of the abutment Q, so as to rest against the inner sides of the flanges of the wheel C, against which they are held by the springs T. The body of the brasses R is made in two parts, halved to each other, as

shown in Fig. 5, so that it may be expanded and contracted longitudinally, to enable its end arms to adjust themselves to the inner sides of the flanges $c^1$ of the wheel C. $r'$ is a plate placed upon the inner side of the brasses R, and against which the springs S rest to prevent steam from passing through the space between the parts of said brasses when said brasses are extended longitudinally. The packing P rests upon and is supported by the block U, the forward side of which is concaved to receive and fit upon the outer side of the packing P. The outer part of the block U is made angular to fit into the end of the case A. The block U is moved forward and back to adjust it by a screw, V, passing in through the middle part of the end of the case A, and is then trued to cause the packing P to bear squarely against the face of the wheel C by the four set-screws $v'$, passing in through the corner parts of the end of the case A. The block U is held down upon its seat by flanges $u^1$ $u^2$, formed upon the inner and outer ends of its base. The flange $u^1$ enters a keeper, W, attached to the bottom of the case A, and the flange $u^2$ passes out through a hole in the end of the said case A. The flange $u^2$ is slotted to receive the screw X, by which the block U is further secured in place. Y is the exhaust-port, which passes through the lower part of the packing P, through the lower part of the block U, and through the bottom of the case A.

The entrance of the steam through the inlet-port $o'$ is regulated by the valve Z, placed in the steam-chest O. The valve-stem A′ passes out through the wall of the steam-chest O, and its outer end is pivoted to the end of an arm, B′, rigidly attached to the shaft C′. The shaft C′ rocks in bearings attached to the end of the case A. One end of the shaft C′ projects beyond the side of the case A, and to it is attached a crank-arm, D′, to receive a notch formed upon the lower side of the connecting-rod E′. The rod E′ slides in guides attached to a bracket, F′, attached to the case A. To the inner side of the outer part of the rod E′ is attached a pin, G′, which enters a groove, H′, in the side of the wheel I′. The groove H′ is made in the general form of a circle, with as many offsets $h'$ as there are pistons D to the wheel C, and in such positions as to operate the valve Z to admit the steam as each piston D passes the inlet-port $o'$. The length of the curves $h'$ regulates the length of time the valve is held open. The rod E′ is made in two parts, connected to each other by a long or swivel nut, $e'$, so that the said rod may be lengthened or shortened to regulate the throw of the valve Z. To the rod E′, directly over the notch that receives the pin of the crank D′, is pivoted a hook, J′, to be hooked upon a pin or neck formed upon the end of the shaft C′. The hook J′ is made of such a length that when hooked upon the shaft C′, the notch of the rod E′ may be raised from the pin of the crank D′, to enable the valve to be operated to start the wheel C, whatever be the position of the said wheel C. A hole is formed in the shaft C′ to receive a hand-lever, as indicated in dotted lines in Fig. 1, for operating the valve Z by hand in starting the wheel C. The upper part of the wheel C is covered with a cap or case, K′, to keep out dust and dirt, but which has nothing to do with the operation of the wheel C.

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

1. The combination of the movable pistons D, the rods E, the boxes G, the bars H, the springs I, the slotted guides J, the levers K, and the slides L, provided with the pin M, with the flanged wheel C and the grooved case A, substantially as herein shown and described.

2. The combination of the steam-chest O, the segmental packing P, provided with the abutments Q, the inlet-port $o'$ and the outlet-port Y, and the adjustable block U, with each other, and with the flanged wheel C and the case A, substantially as herein shown and described.

JOHN CHARLES THOMAS.

Witnesses:
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J. F. GEYER.