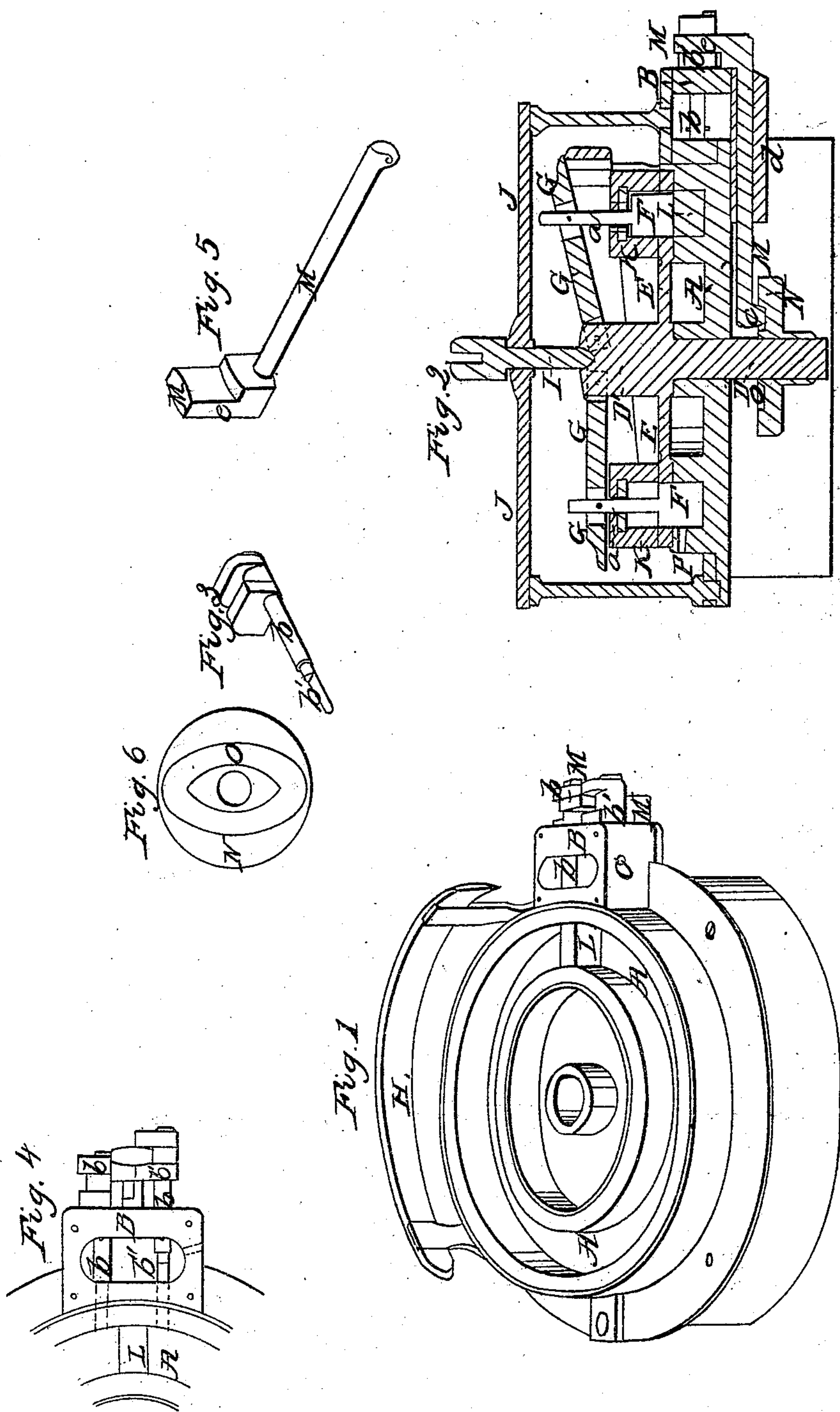


ROTARY STEAM ENGINE.

No. 5,178.

Patented June 26, 1847.



UNITED STATES PATENT OFFICE.

MAHLON GREGG, OF PHILADELPHIA, PENNSYLVANIA.

ROTARY ENGINE.

Specification of Letters Patent No. 5,178, dated June 26, 1847.

To all whom it may concern:

Be it known that I, MAHLON GREGG, of the city of Philadelphia, in the State of Pennsylvania, have made certain new and useful
5 Improvements in the Manner of Constructing Rotary Steam-Engines; and I do hereby declare that the following is a full and exact description thereof.

In its general principle of action my steam
10 engine does not differ from others that have been previously constructed for a like purpose, but I have so combined and arranged the operating parts as to render it more simple and efficient, with little liability to
15 get out of order.

In the accompanying drawing Figure 1, is a perspective view of the main body of the engine, containing the annular steam chamber, the steam box, and certain other
20 appendages; the revolving cap plate, the cover of the steam chest, the pistons and the main shaft, with its eccentric being removed. Fig. 2, is a vertical section through the center of the engine, supposing it to be
25 placed horizontally.

A, A, is the annular steam chamber, into which steam passes from a steam chest B, in which chest C is an opening for receiving the steam pipe.

30 D, Fig. 2, is what I denominate the main shaft, and E, the cap plate, which is in one piece with, or firmly attached to said main shaft.

F, F, are two pistons that fit accurately
35 into the annular steam chamber A, A. This steam chamber is represented as rectangular, or nearly so, but it may be made V shaped, or curved on its lower side should either of these forms be preferred. The pistons are
40 attached by joint pins to levers, or arms, G, G', the inner ends of which have their fulcrums at the upper end D', of the main shaft; the pistons are to be raised at the proper time by the inclined plane H, H,
45 upon which the outer ends G', of the levers are to pass, as the cap plate E, and its appendages are made to revolve by the action of the steam; said inclined plane being curved so as to be concentric with the steam
50 chamber.

I, is a sliding bolt passing through the horizontal bar J, J; the lower end of this bolt rests upo the main shaft D', and this may be pressed down by a weighted lever,
55 or a spring which may be made to bear upon its upper end. This bolt may be re-

placed by a screw, and the bar J, will temper its action by being made somewhat elastic. The piston rods *a, a*, pass through stuffing boxes in the caps K, K, within which
60 caps there are recesses into which the pistons are received when raised from the steam chamber.

L, Fig. 1, is the steam stop, which fills the capacity of the steam chamber, and the
65 steam may be admitted from the steam chest B, on either side of this steam stop, according to the direction in which it is desired that the engine should move. For this purpose there are two valves of a peculiar construction, that serve to admit steam from the
70 steam chest into the steam chamber. One of these valves is shown separately at, *b*, in Fig. 3, and the outer ends, or heads, of both of them at *b', b'*, in Fig. 1, and also
75 in Fig. 4, which latter figure is a top view of the steam chest separate from the other parts of the instrument. When the valves *b*, have their heads *b'*, in contact with the steam chest, they will be closed. When
80 drawn out they admit steam into the steam chamber, their ends *b''*, being diminished in size by tapering them, or rather by cutting them in part way, as shown in the figure. They are cylindrical at the part *b*, and work
85 steam tight in the fore part of the steam chest, when one of them is at work the other is turned around so far as to be out of gear with the valve slide M, shown separately
90 in Fig. 5; the office of this valve slide is to give to one of the valves *b*, its reciprocating motion; the valve slide is operated on in the following manner.

N, is a cam wheel, which is made fast to the main shaft D, and the face of which is
95 shown in Fig. 6.

O, is an eccentric groove on this face, into which the projecting piece *c*, on the inner end of the valve slide M, enters, and as the cam wheel revolves the slide is consequently
100 worked back and forth in the guide socket *d*, through which it passes. The outer end of the valve slide is turned up, as shown *e*, and is received within a notch in the head
105 *b'* of one of the sliding valves, the head of the other valve being turned around so as to free it from the guide; this is shown distinctly in Fig. 4. By merely turning these valves half way around they may be made
110 to engage with, or be disengaged from, said slide.

As there are two sliding valves *b*, so

also there are two inclined planes H, only one of which, however, is to be in use at the same time, and only one of which is shown in the drawing. The
5 other is to occupy a like position on the opposite side of the machine, and they are both made to ship and unship readily, either by being hinged so as to turn up and down, or otherwise. When the engine is
10 to be reversed, the reverse valves and inclined plane are to be brought into action, the former by a semi-rotation on their stems, the latter by the unshipping of one, and the shipping of the other. If both the valve
15 heads are engaged with, or disengaged from, the steam guide, the engine will stop, and may be again put in motion in either direction. The opening for the escape steam is through the side of the steam chamber, immediately opposite to the steam stop L, as
20 shown at P, Fig. 2.

The valve which is raised by the inclined plane will be carried around until escaping from the upper end thereof it will fall by
25 its own gravity, and that of the lever to which it is attached, so as to occupy the steam chamber; and the valve by which steam is to be admitted will then commence opening by the action of the steam slide,
30 will be fully open when the valve has performed a fourth of a revolution, and will then commence closing, and will be closed when the piston is passing the escape open-

ing. The other piston will, in like manner, be brought into action on escaping from the
35 inclined plane and so on alternately.

Having thus fully described the manner in which I construct my improved rotary steam engine, and shown the operation thereof, what I claim therein as new, and desire
40 to secure by Letters Patent, is—

The manner in which I have arranged and combined the apparatus for governing the steam valves, and reversing the motion of the engine, said apparatus consisting of
45 the cam wheel N, the valve slide M, the two valves *b*, *b*, and the two shifting inclined planes H; these parts being combined with the engine and operating, substantially in the manner, and for the purpose, herein
50 fully made known. I do not claim the general manner in which I construct my engine, the steam chamber and the pistons being similar in their operation to those used in other rotary engines; but I limit my claim
55 to the particular arrangement and combination of the parts above designated, by which I attain the ends of governing the admission of steam, and of reversing the motion of the engine in a manner which I believe to be
60 new, and which is simple, convenient, and efficient.

MAHLON GREGG.

Witnesses:

THOS. P. JONES,
WM. J. DONOHOO.