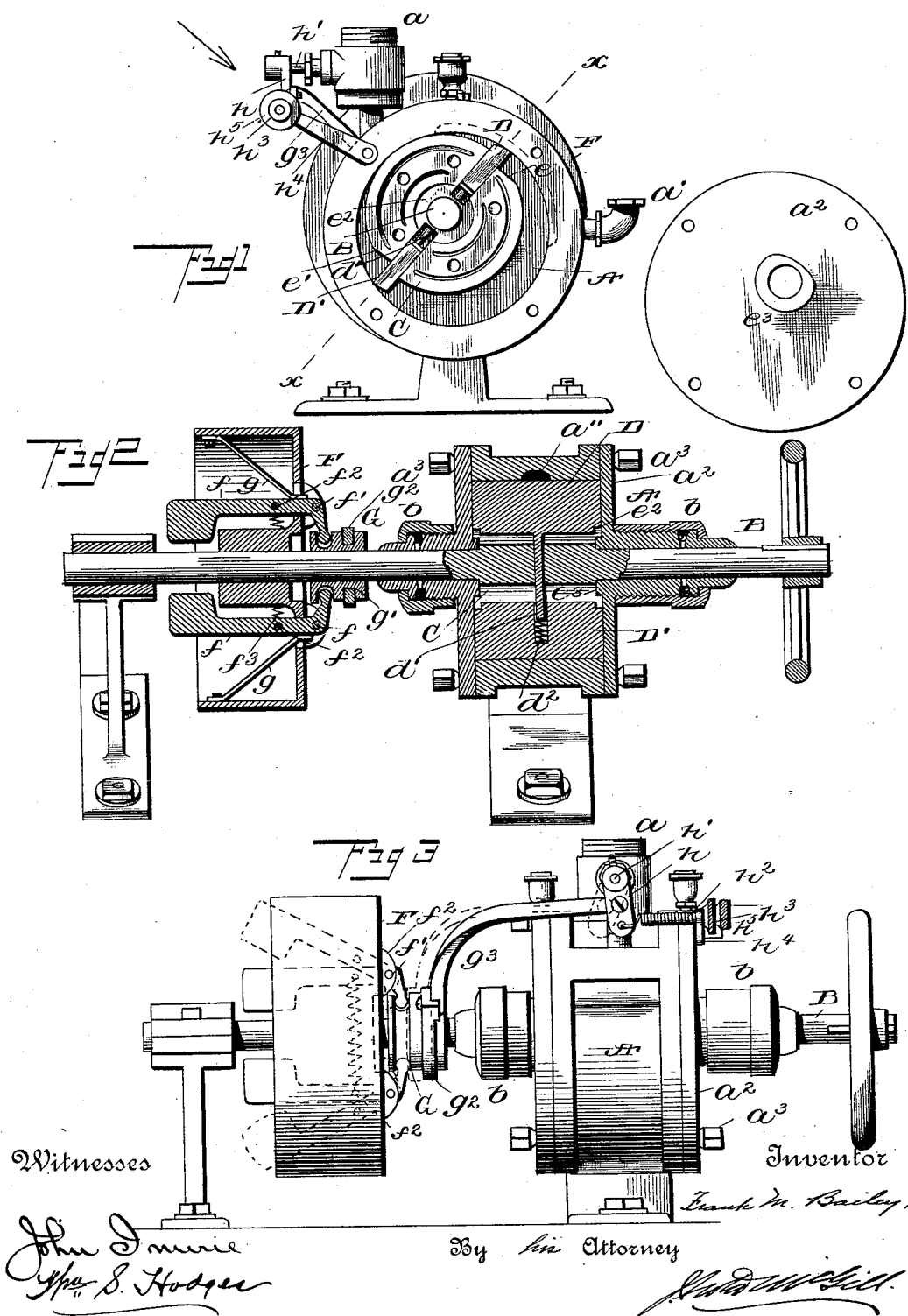


(No Model.)

F. M. BAILEY.
ROTARY ENGINE.

No. 484,769.

Patented Oct. 25, 1892.



UNITED STATES PATENT OFFICE.

FRANK. M. BAILEY, OF LIMA, NEW YORK, ASSIGNOR OF ONE-HALF TO J. A. MCKENZIE AND J. T. GORDON, OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 484,769, dated October 25, 1892.

Application filed July 29, 1891. Serial No. 401,028. (No model.)

To all whom it may concern:

Be it known that I, FRANK. M. BAILEY, a citizen of the United States of America, residing at Lima, in the county of Livingston and State of New York, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

15 This invention relates to a new and improved rotary engine, and has for its object the production of an improved engine of this class which shall be positive in its action and composed of but a minimum number of parts.

20 The invention comprises the detail construction, combination, and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claim.

25 In the accompanying drawings, Figure 1 is an end elevation with the cylinder-head removed. Fig. 2 is an approximately-horizontal sectional view on the line xx , Fig. 1. Fig. 3 is a view in side elevation, parts being in dotted lines.

Referring to the drawings, A designates a cylinder or circular chamber suitably mounted in position; a , the steam-inlet port opening into said cylinder at the upper portion of one side thereof, and a' the steam-outlet port opening into said cylinder at about the center of its opposite side. In the inner surface of cylinder A is a groove or recess a'' , which extends from the outlet-port a' to the top of said cylinder, the same serving as a back-pressure relief. The head-plates a^2 are rigidly secured in place by threaded bolts a^3 , and to each of these head-plates are secured stuffing-boxes b , through which the main shaft B is passed.

30 C is the piston head or wheel rigidly secured upon or formed with shaft B and located within cylinder A. In this head C are two opposite longitudinal slots or openings d , which extend from end to end of the head and from shaft B to the outer periphery of said head. Within these slots or openings are wings or plates D D', which fit snug in said slots, the outer ends of said wings being slightly curved or beveled to conform with the inner surface of cylinder A, with which they

are constantly in contact. From the wing or plate D projects a rod d' , which is extended through a corresponding hole or aperture in shaft B and into a coincident hole or opening d in the wing D', in which latter is a small coil-spring d^2 , which bears against said rod d' . The piston-head C is perfectly circular, save for two recesses $e e'$, adjacent to the slots or openings d , which recesses are above the protruding ends of the wings when the latter pass the steam-inlet port. In the end faces of piston-head C are circular grooves or recesses e^2 , adjacent to shaft B. Into these grooves or recesses e^2 project cams e^3 , formed on the inner faces of the cylinder-heads. The extreme outer or thickened portions of these cams correspond with the steam-inlet port—that is, they are arranged on a line with said port, so that as the plates or wings are passing the inlet-port they are held out tight against the cylinder and all wobbling or shaking is prevented. Thus the cams act as locks for the wings or plates and render the action of the latter sure and positive.

75 The operation of my improved engine is as follows: The rotary shaft is turned by a hand-wheel, as E, until one of the wings is brought just beneath the steam-inlet port, when the admitted steam bearing thereon will impart motion to the piston-head, and the steam being confined to the space formed between the wing and the point of contact at the top of the cylinder the piston-head will be driven around, and upon the wing passing the escape-port the steam will pass thereout. By this time the other wing has passed over the steam-inlet port and a fresh impetus or continuous power is had by the steam-pressure thereon, said wings being held tight against the cylinder as they pass said steam-inlet port by the extreme outer portions of the locking-cams of the cylinder-heads.

80 From what has been said it will be seen that I have produced a rotary engine which is simple in construction, is strong and durable, and is composed of but a minimum number of parts. All wobbling or shaking or concussion or uneven motion is successfully avoided, and an even rapid power is secured. One of the most important advantages is that the steam-cylinder is a perfect cylinder, and

hence there is no jerking or unevenness of movement and the wings are held firmly in place by the protruding portions of the cams as they pass the steam-inlet port.

5 In connection with my improved rotary engine I preferably employ an automatic governor, which latter forms the subject-matter of a separate application for patent, filed August 22, 1891, Serial No. 463,443. Briefly described, said governor comprises two weighted arms pivotally mounted in the pulley, from which the motion of the engine is secured, said arms being forced outward by centrifugal action and thereby through the agency of an arm controlling the position of the valve in the steam-inlet pipe.

F is a pulley mounted on shaft B; f f , two weighted arms pivoted at f' between lugs of said pulley; f^2 , cross-bars projecting from said arms, and f^3 coil springs connected at their ends to said cross-bars. To the inner periphery of pulley F are connected flat springs g , the outer free ends of which bear upon arms f at the points where the latter project through openings in said pulley.

G is a sliding sleeve or collar on shaft B, and the same is provided with a circumferential groove or recess g' , wherein project the rounded ends of arms f . To an encircling band g^2 of this sleeve or collar is rigidly connected one end of an arm g^3 , the outer end of which is pivotally connected to an arm h , the hub of which is keyed or locked upon the shaft h' of a valve located in the steam-inlet pipe. To this arm h is connected one end of a coil-spring h^2 , the other end of which is se-

cured upon an adjusting-screw h^3 , supported by an arm h^4 , rigidly attached to cylinder A by one of the screws a^2 thereof. A milled nut h^5 is on the threaded portion of this screw h^3 , and by means thereof the proper tension can be placed upon the governor, according as it is desired to increase or diminish the speed thereof. In this way the speed of the engine is automatically controlled by the speed set for the band-wheel or pulley, the speed of the latter controlling that of the former.

I claim as my invention—

The herein-described improved rotary engine, comprising the casing or cylinder having the steam inlet and outlet ports, the cylindrical piston-head arranged eccentrically therein and provided with diametrical slots and centrally at each end with a recess, as at e^2 , outwardly-yielding plates or wings disposed in said slots and provided one with a rod projecting from its inner longitudinal edge and the other with a hole or opening for said rod, a spring located in said hole or opening, and the cylinder-heads provided with cams entering said recesses and having their extreme outer portions corresponding with said steam-inlet port and with which the ends of said plates or wings are designed to engage as they pass said steam-inlet port, whereby they are forced outwardly by said cams, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK. M. BAILEY.

Witnesses:

S. EDGAR BRONSON,
W. H. BUELL.