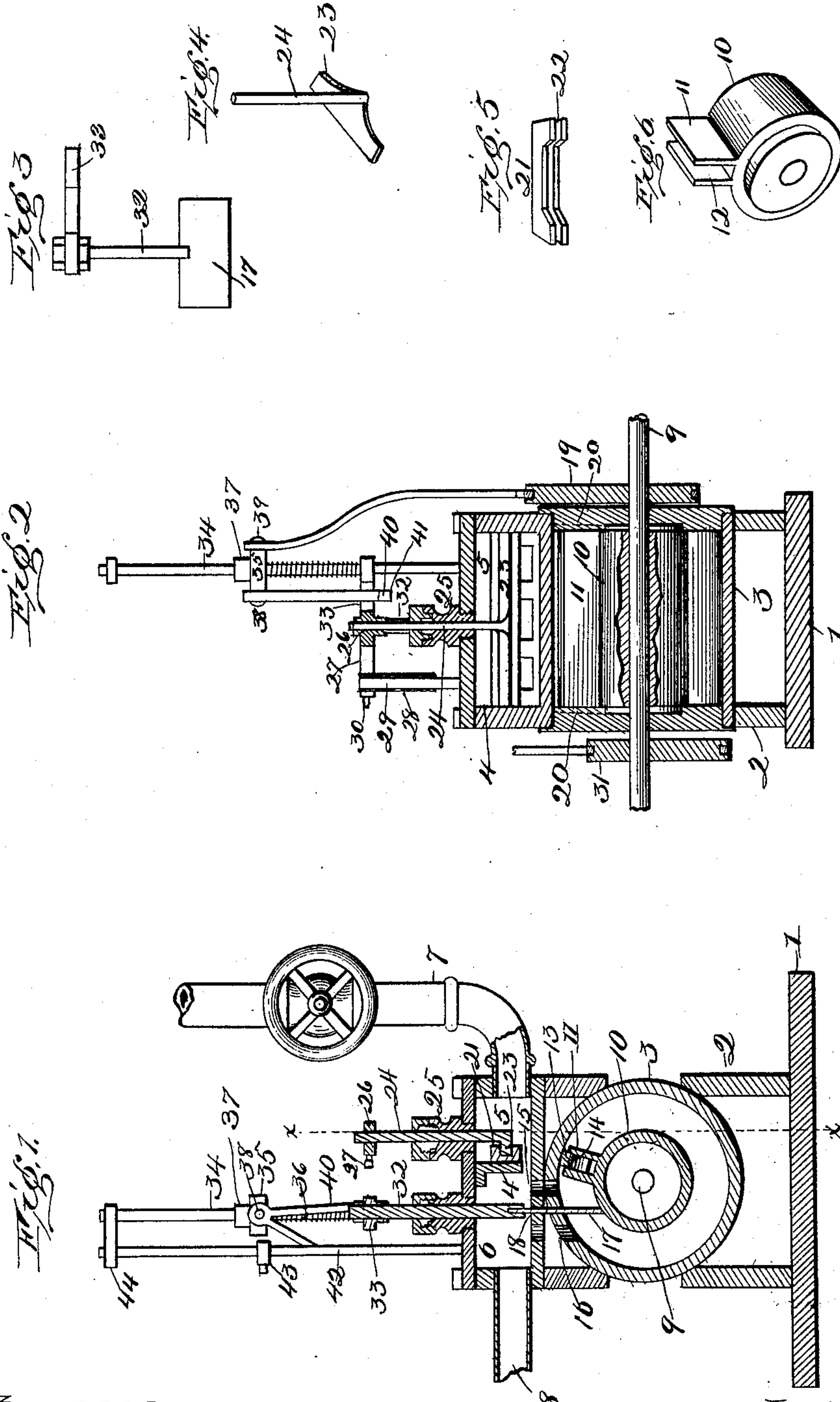


(No Model.)

F. PRIESTLEY.
ROTARY ENGINE.

No. 603,737.

Patented May 10, 1898.



Witnesses
J. M. Fowler
W. H. Fowler

Inventor
Frank Priestley
by Patrick Farrell
Attorney

UNITED STATES PATENT OFFICE.

FRANK PRIESTLEY, OF SIOUX RAPIDS, IOWA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 603,737, dated May 10, 1898.

Application filed April 26, 1897. Serial No. 633,970. (No model.)

To all whom it may concern:

Be it known that I, FRANK PRIESTLEY, a citizen of the United States of America, residing at Sioux Rapids, in the county of Buena Vista and State of Iowa, 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.

My invention relates to rotary engines; and it has for its object to construct such an engine as will be durable, economical in construction, efficient in generating uniform and powerful energy, and will occupy but small floor-space; and it consists in the novel features of construction, as will be hereinafter more fully set forth.

Referring to the accompanying drawings, in which the same numeral of reference indicates a corresponding part in each of the views in which it occurs, Figure 1 is a vertical sectional view at right angles to the axis of the cylinder. Fig. 2 is a similar view taken through the line *x x* of Fig. 1, and Figs. 3, 4, 5, and 6 are detail views.

Referring more particularly to the drawings, 1 indicates the base of the machine, which is preferably rectangular in shape and of sufficient size to support the entire engine. Upon the base is secured a suitable frame or casing 2, within which is located the cylinder 3 and at the top of which is the steam-chest, across which is a partition 4, dividing the chest into a steam-chamber 5 and an exhaust-chamber 6. A supply-pipe 7 communicates with the steam-chamber, and an exhaust-pipe 8 leads from the exhaust-chamber in the usual manner.

Journaled concentrically within the cylinder upon the shaft 9 is a piston 10, from one side of which projects a wing 11, that extends nearly to the inner periphery of the cylinder. The side and ends of this wing are grooved, as shown at 12, within which are located the packing-strips 13, which are kept in constant pressure against the interior of the cylinder and the cylinder-head by suitable springs 14. Suitable supply-ports 15 and exhaust-ports 16 lead from the cylinder to the steam-chamber and the exhaust-chamber, respectively, and between them is located a vertically-movable slide or gate 17, which passes through the slot

18 and is adapted to be moved between the piston and the periphery of the cylinder by means of a suitable eccentric 19 upon the shaft 9. The ends of the slide preferably move in the vertical grooves 20 in the ends of the heads of the cylinder, as shown in dotted lines in Fig. 2.

The partition 4 is provided with suitable ports communicating with the ports in the cylinder, which are controlled by the vertically-moving valve 21. This valve may have its ends enlarged and slotted longitudinally, as shown at 22, within which fits a cross-head 23 on the lower end of the valve-stem 24. The stem projects up through the casing and is provided with the ordinary stuffing-box 25. To the upper end of the stem a head 26 is adjustably secured by set-screws 27 and has its opposite end provided with a sleeve or collar 28, which moves vertically on the guide-post 29. The end of the head is formed or provided with a wrist-pin 30 for the reception of the eccentric 31 for reciprocating the head and valve.

The upper end of the stem 32 of the gate 17 is provided with a cross-head 33, which has its free end movably secured to the vertical rod 34. A collar 35 is secured to the rod above the head at a sufficient distance to permit of a coiled spring 36 being placed between the head and the collar for the purpose of forcing the head and gate downward. Above the collar on the rod is located a sleeve 37, provided with two wrist-pins 38 and 39, to one of which the eccentric 19 is connected for giving it a vertical movement upon the rod, and upon the other wrist-pin is pivotally secured an inverted-V-shaped latch or dog 40, one arm of which is longer than the other and provided with a hook or catch 41, which engages with the head 33 on its downward movement and raises the gate when the sleeve is moved upward. The short arm of the latch travels adjacent to another vertical rod 42, on which is adjustably secured a collar or trip 43 for engaging with the short arm of the latch and forcing the catch on the longer arm out from under the head on the gate-stem. As soon as the disengagement of the head from the latch takes place, the spring, which has been placed under tension by the upward movement of the head, instantly expands and forces the

gate down to its extreme limit or substantially into engagement with the piston within the cylinder. The upper ends of the rods 34 and 42 are preferably provided with a cross-bar 44.

5 In operation the parts are so timed and related to each other that when they are in the position shown in Fig. 1 steam entering through the supply-pipe will pass immediately between the wing of the piston and the
10 gate behind it, and, expanding, will force the wing away from the gate with great force, and rapidly, thereby imparting rotary motion to the shaft, to which may be secured any desired means for transmitting the power of the
15 engine to the machinery to be moved. As the shaft revolves, the eccentric causes the valve to close the ports and shut off the supply of steam, which may be adjusted to take place at any desired portion of the stroke, and
20 thereby economize the use of the steam to the amount of power required to be developed. As the piston and shaft revolve the eccentric for operating the gate is put into operation, so that just before the wing reaches the gate
25 the gate is quickly lifted out of the cylinder and held out of the way until after the wing has passed beyond the slot, when the catch is released from the head of the gate and the gate is instantly forced down by the reaction
30 of the spring. As soon as the parts have assumed this position, the eccentric opens the ports from the steam-chambers by moving the valve, and the steam again rushes in and drives the cylinder around, as before de-
35 scribed. In this manner a very rapid motion may be communicated to the cylinder and the shaft, which in turn is transmitted where desired.

40 It is evident that the engine may be provided with any suitable form of governor; but as this forms no part of my invention I have not thought it worth while to show and describe the same. It is also evident that the shaft may be provided with the ordinary fly-
45 wheel for assisting in storing the motion and

also in causing the piston to revolve with more uniform speed. By locating the cylinder so near the base the engine can be made very compact, thereby saving floor-space, as well as height. As all of the parts, except the
50 piston, gate, and valve, are upon the outside, and the inclosed parts may be easily reached by removing the heads of the cylinder or top of the steam-chest, it is evident that the engine may be quickly repaired in case of acci-
55 dent or for any other purpose.

Having thus described my invention, I claim—

1. In a rotary engine, the combination, with a concentrically-located piston provided with
60 a wing, of a gate provided with a head, two vertical rods, the head of the gate engaging with one of said rods, a collar adjustably secured upon each of said rods, a spring on one
65 of the rods between the collar and the head of the gate, a sleeve on the rod, a latch pivotally secured to the sleeve one part of which is provided with a catch and is adapted to engage with the head of the gate, and another
70 part is adapted to engage with the collar on the other rod, and means for moving the sleeve, substantially as set forth.

2. In a rotary engine, the combination, with a cylinder, of a piston journaled concentric-
75 ally therein, a steam-chest, a partition therein provided with ports, a valve for the ports provided with a longitudinal slot, a stem, the lower end of which is provided with a cross-head that fits within the slot, a guide-post, a
80 head adjustably secured to the top of the stem and provided with a sleeve to fit upon the guide-post, and an eccentric connected with the head, substantially as set forth.

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

FRANK PRIESTLEY.

Witnesses:

ROY G. HULETT,
CHAS. B. MILLS.