No. 827,276. PATENTED JULY 31, 1906.

W. E. WEBER.

ROTARY ENGINE.

APPLICATION FILED NOV. 18, 1905.

2 SHEETS—SHEET 1.

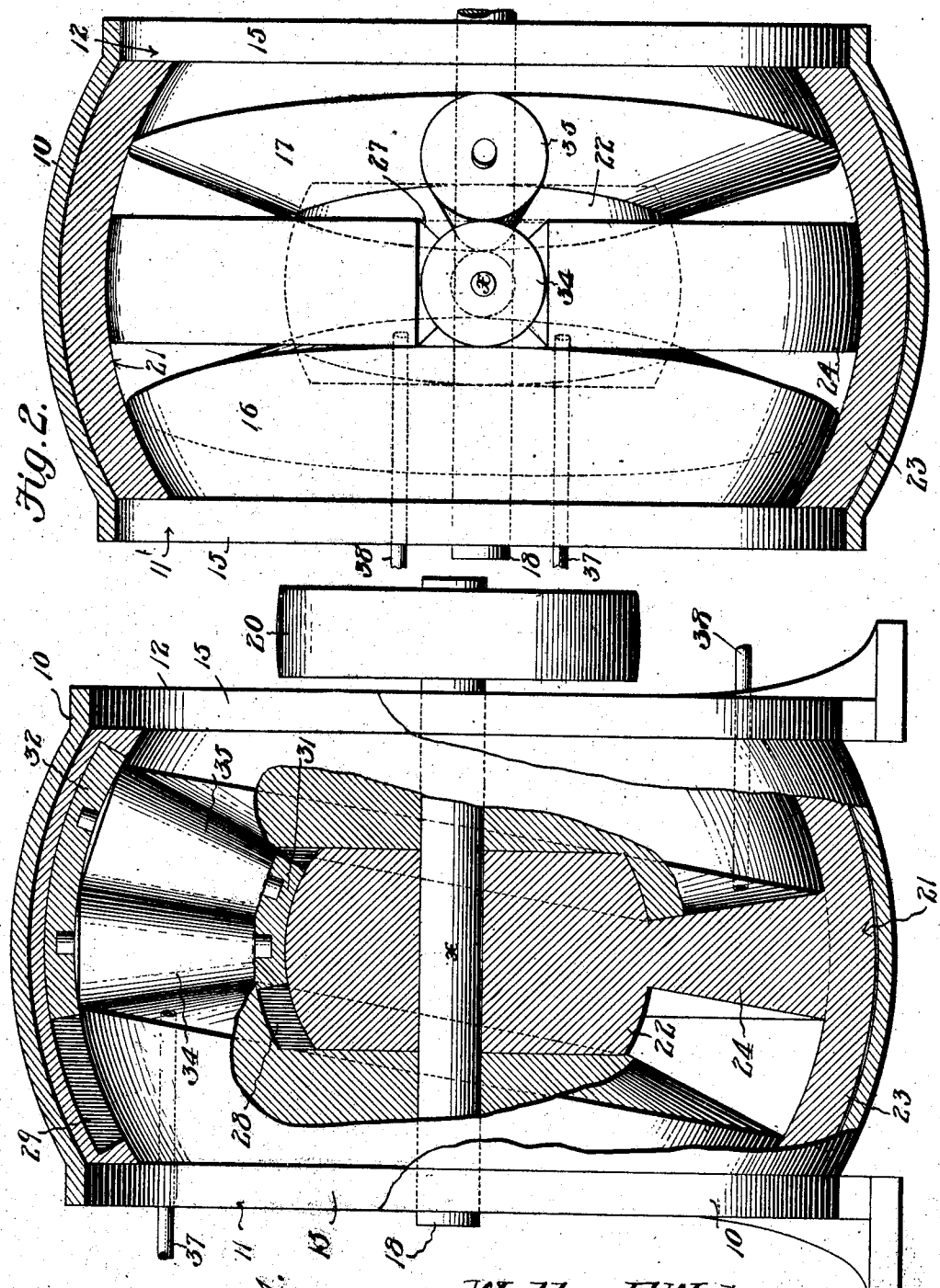


Fig. 2.

Fig. 1.

Witnesses

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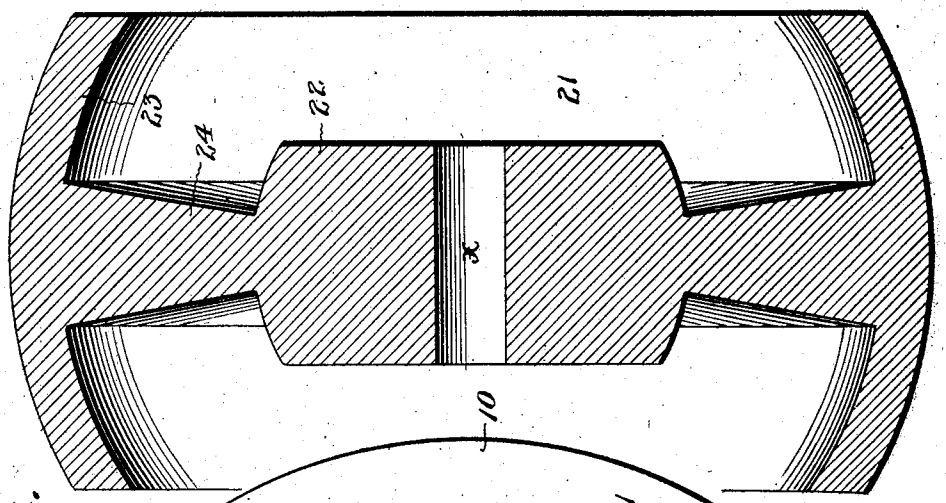


Fig. 4.

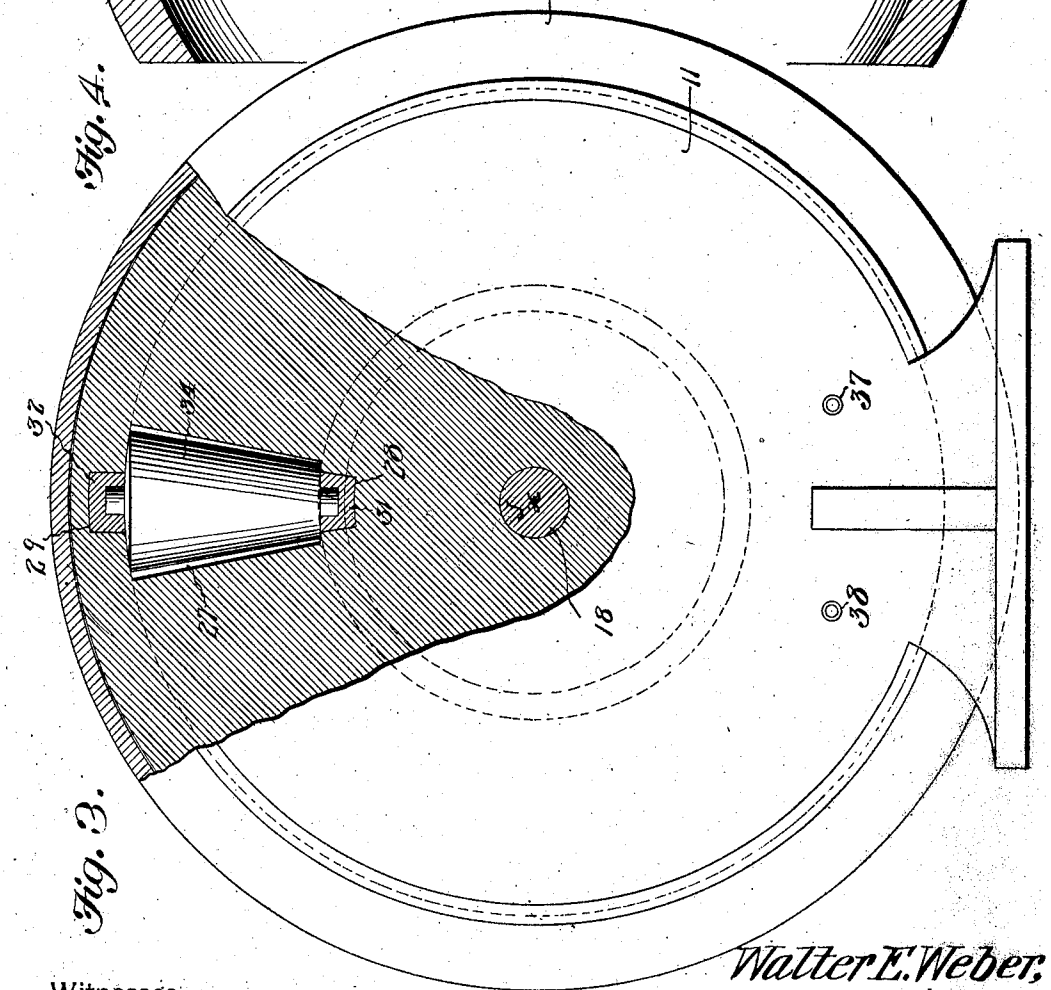


Fig. 3.

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UNITED STATES PATENT OFFICE.

WALTER E. WEBER, OF JERSEYVILLE, ILLINOIS.

ROTARY ENGINE.

No. 827,276. Specification of Letters Patent. Patented July 31, 1906.

Application filed November 18 1905. Serial No. 287,996.

To all whom it may concern:

Be it known that I, WALTER E. WEBER, a citizen of the United States, residing at Jerseyville, in the county of Jersey and State of Illinois, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates to rotary engines, and has for one of its objects to provide an engine in which a revoluble piston disk or drum is provided with a laterally-movable piston-wing that moves through the body of the piston and presents a pressure area that increases and decreases gradually throughout each rotative movement.

A further object of the invention is to construct a rotary engine having a revoluble piston disk or drum that carries a piston-wing movable by engagement with fixed portions of the cylinder in a direction at a right angle to the plane of rotative movement of the piston member, and, further, to provide a piston and cylinder in which the side walls of the cylinder are in a plane oblique to the plane of rotative movement of the piston.

A further object of the invention is to construct a rotary engine having a piston-wing formed of a plurality of rollers the surfaces of which form steam-tight joints with each other and with the side walls of the cylinder, the piston-wing rotating without any sliding friction whatever.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional elevation of a rotary engine constructed in accordance with the invention. Fig. 2 is a plan view showing the cylinder and the piston-rim in section. Fig. 3 is a side elevation of the engine, parts being broken away and the upper portion of the piston being illustrated in section. Fig. 4 is a detail sectional view of the revoluble piston member detached.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The cylinder of the engine includes a curved shell or casing 10 and a pair of stationary heads 11 and 12, the latter forming a part of the rigid base or bed of the engine. The heads 11 and 12 each include an outer circular disk 15 and an inwardly-projecting portion, the inner face of which forms a wall of the cylinder proper. These two inwardly-projecting portions 16 and 17 have their peripheries curved on lines that are struck from a central point x, being the point of intersection of the longitudinal axis of the main shaft x and the mid vertical plane of the cylinder. The inner faces of the two cylinder-head members 16 and 17 are frusto-conical in form, the vertex of each of the cones being at a central point x and the common axis of the two cones being in a plane oblique to the longitudinal plane of the axis of shaft 18 and intersecting the latter at the point x.

The shaft 18 is provided with suitable bearings in the end walls of the cylinder and carries at one end a suitable belt-wheel 20. On this shaft is secured a piston member 21, having a central hub 22, the periphery of which is arranged on a curved line struck from the central point x, and the piston has a rim 23, the inner and outer walls of which are also arranged on curved lines struck from the center x. The hub and rim of the piston are united by a web 24, that gradually reduces in thickness from the rim inward, and the side walls of this rim are arranged on lines that radiate from the center x. The inner surface of the rim extends over the curved peripheries of the cylinder members 16 and 17, the walls of said recesses being also arranged on lines that are struck from the center x.

A portion of the rim 24 is cut away to form an opening 27, the two side walls of which are arranged on lines that radiate from the center x, and at the top and bottom on inner and outer ends of this opening are arranged grooves 28 and 29, said grooves being formed in the periphery of the hub and the inner portion of the rim of the piston, respectively. The inner walls of these grooves are arranged on curved lines that are struck from the center x, and their side walls are arranged on radial lines that are struck from the center x. Fitting within these grooves are arcuate slide-

bars 31 and 32, respectively, said bars being also arranged on curved lines struck from the center x.

The piston-wing is formed of a pair of frusto-conical rollers 34 and 35, having end pintles 36, that extend into recesses formed in the slidable bars 31 and 32. The rollers 34 and 35 are of such width as to exactly fill the space between the conical faces between the piston members 16 and 17, and the vertexes of the cones of which the rollers are formed is at the center x, while the outer ends of said rollers are arranged on curved lines that also are struck from the center x.

The steam is admitted through ports 37 and exhausts through ports 38, and in practice steam or other fluid under pressure admitted immediately behind the roller 34 will pass through the opening 27 to a position behind the roller 35 and will occupy all that space between the rear faces of the rollers and the point where the cylinder member 17 engages with the face of the piston-web 24, the point of contact between these two being close enough to be steam-tight. The cylinder member 17 therefore forms a fixed abutment, and as the piston-wing is movable it will be forced around, carrying the piston with it. The two frusto-conical rollers being in engagement with each other and in engagement with the conical faces of the cylinder members 16 and 17 will roll on each other and on said cylinder member without any sliding friction whatever, and as the piston-wing continues to move the inclined surface of the cylinder member 17 will force said wing toward the left or through the opening 27, so that a portion of the piston-wing will then be projected on the opposite side of the piston-drum and will present a pressure area of gradually-increasing size on which the steam may act.

Having thus described the invention, what is claimed is—

1. In a rotary engine, a piston-wing formed of rollers in engagement with each other, and with the side walls of the cylinder.

2. In a rotary engine, a piston-wing formed of rollers in steam-tight contact.

3. In a rotary engine, a revoluble piston member, a piston-wing carried thereby and formed of a plurality of frusto-conical rollers in steam-tight contact, and stationary cylinder members having conical surfaces for engagement with said rollers.

4. In a rotary engine, a revoluble piston-drum having a transversely-disposed opening, laterally-movable bars guided by said drum, and a piston-wing formed of rollers having end pintles mounted in said bars and forming a piston-wing that is movable alternately from side to side of the drum.

5. In a rotary engine, a revoluble piston-drum having hub, web and peripheral flange members, the web being provided with an opening, and the hub and flange having grooves, slidable bars mounted in said grooves, and a piston-wing formed of rollers having their end pintles mounted in said bars, the piston-wing being movable through the opening to present the pressure areas alternately on opposite sides of said piston-drum.

6. In a rotary engine, a cylinder having stationary end members, the inner faces of which are conical, the axial plane common to both conical faces being oblique to the plane of the axis of the cylinder, a shaft extending through the cylinder-walls in the plane of said cylinder-axis, a piston-drum mounted on the shaft and having a central hub fitting within recesses formed in the cylinder members and provided with a hub that extends over such cylinder members, and a piston-wing carried by said piston member and engaging the conical surfaces of the cylinder, whereby said piston-wing is moved laterally to present pressure areas alternately on opposite sides of the piston.

7. In a rotary engine, a cylinder, a main shaft supported by the cylinder, the end members of said cylinder having conical inner faces, the vertexes of such conical faces being at the vertical center of the longitudinal axes of the shaft and cylinder proper, and the common axial plane of the cones being in a plane oblique to the plane of such longitudinal axis and intersecting therewith at the vertexes of the cones, a revoluble piston member having a hub, the periphery of which is arranged on a curved line struck from said point of intersection, said piston having, also, a rim, the inner and outer walls of which are arranged on curved lines also struck from said center, slidable bars arranged in the hub and in the rim and movable in a direction at a right angle to the plane of rotation of the piston, and a piston-wing formed of frusto-conical rollers having end pintles mounted in said bars, the vertexes of the roll-peripheries being also at said point of intersection.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WALTER E. WEBER.

Witnesses:

OTTO ECK,

CHAS. S. WHITE.