No. 776,058. PATENTED NOV. 29, 1904.

C. F. HEINZE.

ROTARY ENGINE.

APPLICATION FILED FEB. 26, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

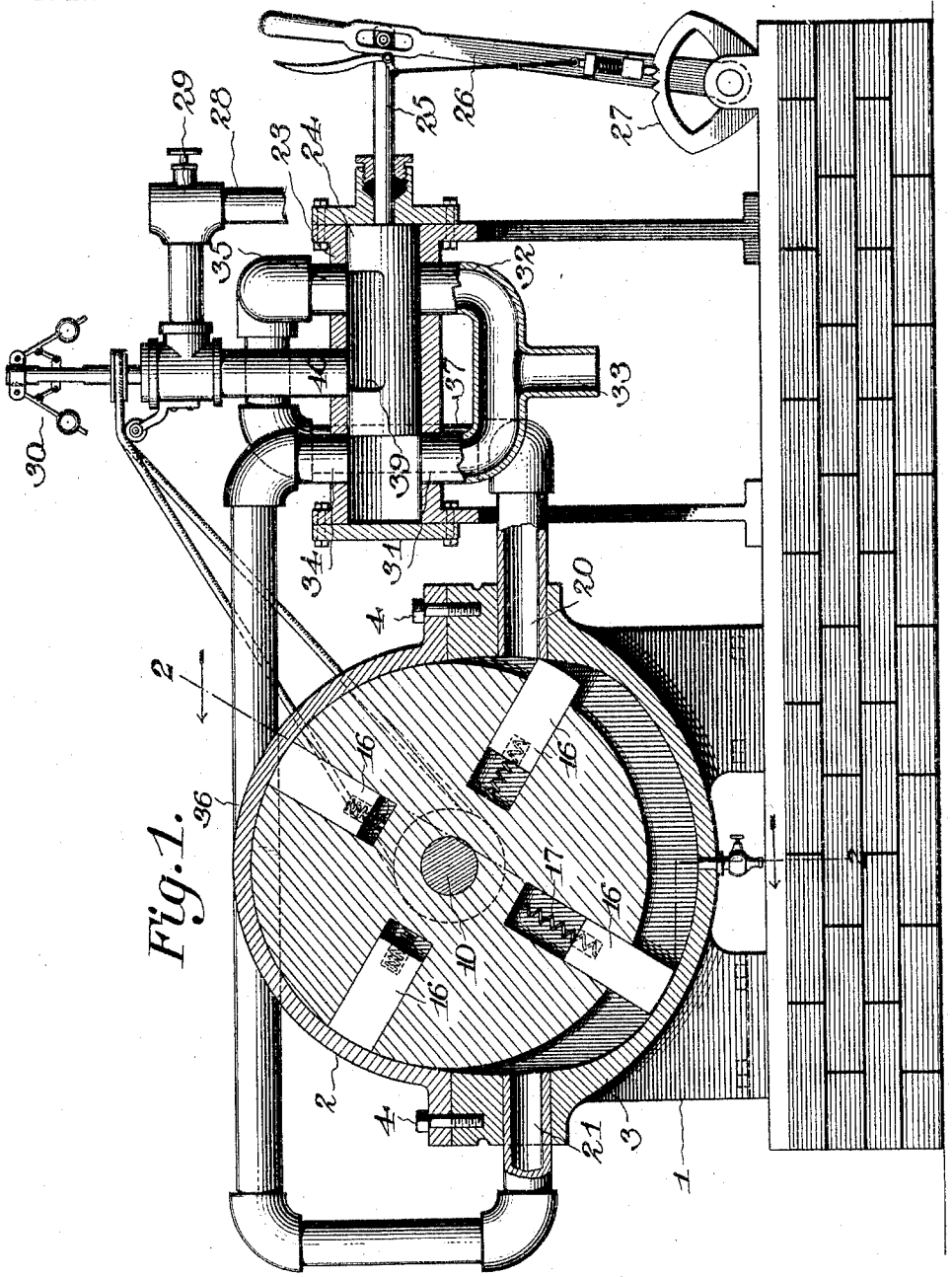


Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

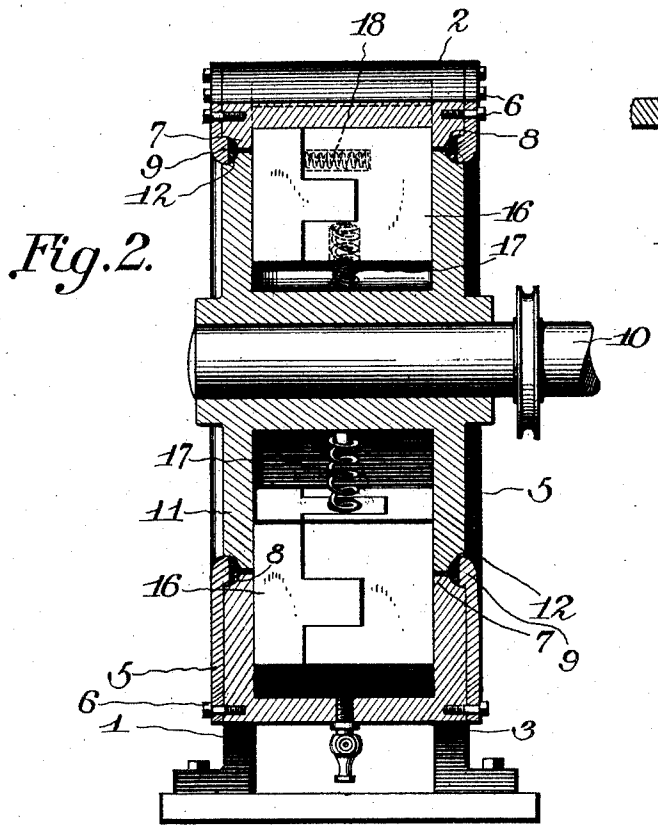


Fig. 2.

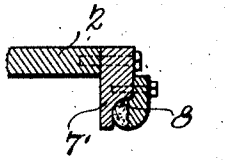


Fig. 4.

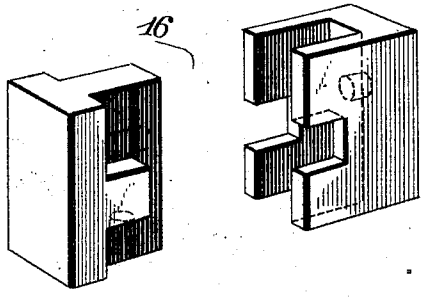


Fig. 3.

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No. 776,058. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

CHARLES F. HEINZE, OF CLIFFORD, NORTH DAKOTA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 776,058, dated November 29, 1904.

Application filed February 26, 1904. Serial No. 195,462. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. HEINZE, a citizen of the United States, residing at Clifford, in the county of Traill and State of North Dakota, have invented a new and useful Rotary Steam-Engine, of which the following is a specification.

This invention relates to certain improvements in rotary engines, and has for its principal object to provide a novel form of engine in which the area of the parts in rubbing contact will be reduced to a minimum, the revoluble piston-drum being provided with a plurality of radially-movable wings, of which only a small portion of the opposite edges will be in frictional contact with the opposite stationary heads of the cylinder.

A further object of the invention is to provide a novel form of piston-wing made in sections in such manner as to be automatically adjustable to compensate for wear and the sections being so disposed as to prevent the passage of steam.

A still further object of the invention is to provide a novel reversing means by which the steam may be directed to either side of the engine.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in the novel construction and arrangement of parts hereinafter 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 longitudinal sectional elevation of a rotary engine constructed in accordance with the invention. Fig. 2 is a sectional elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a detail perspective view of one of the movable piston-wings detached. Fig. 4 is a detail view illustrating a slight modification in the construction of the cylinder.

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

The engine is provided with a suitable bed or supporting-frame 1, by which it may be bolted or otherwise secured in position, and the cylinder for convenience is preferably made in two sections 2 and 3, that are secured together by bolts 4. The stationary cylinder-heads 5 are in the form of rings, which are secured to the opposite sides of the cylinder proper by bolts 6, and the opposite sides of said cylinder are provided with inwardly-extending flanges 7, the edges of which are recessed, as indicated at 8, for the reception of suitable packing. The inner edge of each of the cylinder-heads is turned inward, forming a flange 9, which projects into the packing-recess and serves to assist in holding the packing in place, while the bolts 6 may be turned in order to hold the packing under any desired degree of pressure.

The frame is provided with suitable bearings for the support of a main shaft 10, on which is secured a revoluble piston-drum 11, the width of which is about equal to the width of the cylinder proper, and the upper edges of said piston-drum are provided with recesses 12 in order to form a portion of the packing-receiving pocket. In the piston-drum are formed radial recesses, of which there may be any desired number, and in each of these recesses is secured a two-part piston-wing 16, that is forced outward into engagement with the curved wall of the cylinder by means of a spring 17. The two sections are provided with overlapping parts, one of the sections having a projecting tongue adapted to engage between a pair of spaced flanges on the opposite section, and each of these spaced flanges is provided with recesses for the reception of projecting lugs carried by and projecting laterally from the tongue, so that the parts will interlap to an extent sufficient to prevent the passage of steam and automatically adjust themselves to take up the wear which occurs between the opposite sides of the wing and

the inner surface of the cylinder-flange 7. The two sections of the wing are separated by means of one or more springs 18, placed in cups formed in the adjacent faces of the sections.

The steam is supplied through a cylinder-port 20 and exhausts through a port 21 after exerting its force on the piston-wings, or the steam may enter at the port 21 and exhaust through port 20 in accordance with the direction in which the piston is to be rotated.

At a point adjacent to the engine is arranged a small cylinder 23, adapted to receive a slidable piston-valve 24, provided with slidable packing means, and from said valve extends a stem 25, passing through a suitable stationary box at one end of the cylinder and connected to a reversing-lever 26, that is preferably provided with a latch-bar for engaging a locking-segment 27, so that the valve-lever may be held in any position to which it may be adjusted.

The steam enters through a pipe 28, having a throttle-valve 29 and provided with a governor 30, which may be driven from the engine, and the steam is exhausted through two ports 31 and 32, which are connected to a common discharge-pipe 33. The two ports 31 and 32 are in horizontal alinement at the lower side of the cylinder 23, and at the top of the cylinder and immediately opposite the ports 31 and 32 are ports 34 and 35, respectively, one of these ports, 34, being connected by a pipe 36 to the cylinder-port 21 and the other port, 35, being connected by a pipe 37 to the cylinder-port 20.

The slidable piston-valve 24 is provided with a port 39, which at all times is in communication with the main inlet supply-port 40 and which may be placed in communication with either of the ports 34 35 or may be placed in mid-position, so as to entirely cut off the supply of steam to the engine.

When in the position shown in Fig. 1, steam enters through port 40 to port 39 and thence by port 35 and pipe 37 to the cylinder-port 20, revolving the piston-drum in the direction indicated by the arrow. The exhaust-steam from the engine passes out through the port 21 to pipe 36 and port 34. From the port 34 the steam enters the cylinder 23 and passes out through the port 21 to the exhaust-pipe 33.

When the position of the valve 24 is shifted until the lever 26 is in a vertical position, all of the ports will be cut off, the length of the port 39 being less than the distance between the two ports 34 and 35. When the valve is at the limit of its movement in the opposite direction, the course of the steam will be through port 40, through port 39 to port 34, and pipe 36 to cylinder-port 21, thus revolving the piston-drum in a direction opposite to that indicated by the arrow. The exhaust-steam passes out through port 20, pipe 37, port 35, and cylinder 23 by way of port 32 to the exhaust-pipe 33.

In an engine of this type it is obvious that the wear on the piston-wings is very limited, and the construction of the wings is such as to automatically take up for any wear of the parts. It is further obvious that the direction of the rotation of the engine may be changed at will by merely operating the lever 26.

The construction of the cylinder may be slightly modified by forming the inwardly-projecting side flanges 7′ separate from the main body of the cylinder and bolting them in position, as shown, for instance, in Fig. 4.

Having thus described the invention, what is claimed is—

1. In a rotary engine, a cylinder including a ring member having inturned flanges at its opposite edges, removable heads in the form of rings secured to the opposite edges of the cylinder, a revoluble piston-drum, and a plurality of radially-movable wings carried by the drum and engaging the inner wall of the cylinder, the width of the wings being approximately equal to the distance between the inner walls of said flanges.

2. In a rotary engine, a cylinder having inturned flanges, the outer faces of which are recessed, a revoluble piston-drum also having recesses in its outer face, the two sets of recesses forming packing-spaces, radially-movable wings carried by the drum, and flanged rings carried by the cylinder and having portions projecting within said packing-spaces.

3. In a rotary steam-engine, a cylinder having inturned flanges, the outer faces of which are recessed, a piston-drum also provided with recessed outer faces adjacent to those of the flanges and forming in connection therewith spaces for the reception of packing, radially-movable piston-wings carried by the drum, and flanged rings secured to the cylinder and forming heads therefor, the flanged portions of the rings projecting into said packing-spaces.

4. In a rotary engine, a cylinder having radially-projecting flanges disposed at its opposite edges, the outer walls of the flanges being recessed, a revoluble piston-drum, the outer edges of which are recessed to form packing-spaces in connection with the recesses of the flanges, ring-like cylinder-heads having inwardly-projecting flanges fitting within the packing-spaces, radially-movable wings carried by the drum, and means for projecting said wings.

5. In a rotary engine, a piston-drum having a plurality of radially-arranged recesses, a cylinder, and piston-wings each formed of

a pair of sections, one of such sections having a projecting tongue and the other a pair of spaced flanges for the reception of the tongue, such flanges being provided with recesses, the tongue-carrying section having laterally-projecting lugs or blocks adapted to said recesses, substantially as specified.

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

CHARLES F. HEINZE.

Witnesses:

GEO. O. STOMNER,

H. N. HANSON.