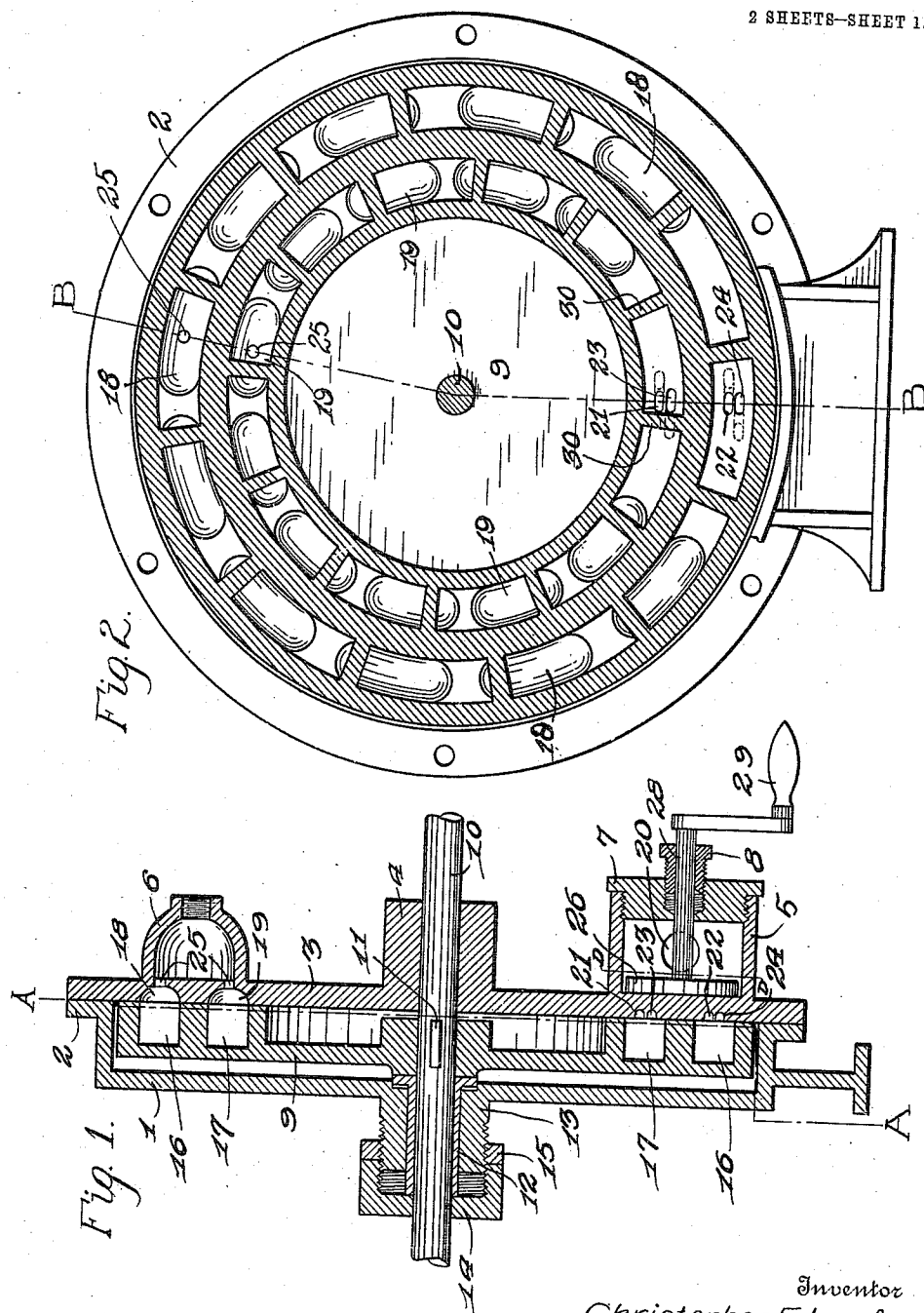


986,016.

C. F. LAUFER.
STEAM ENGINE.
APPLICATION FILED MAY 31, 1910.

Patented Mar. 7, 1911.

2 SHEETS-SHEET 1.



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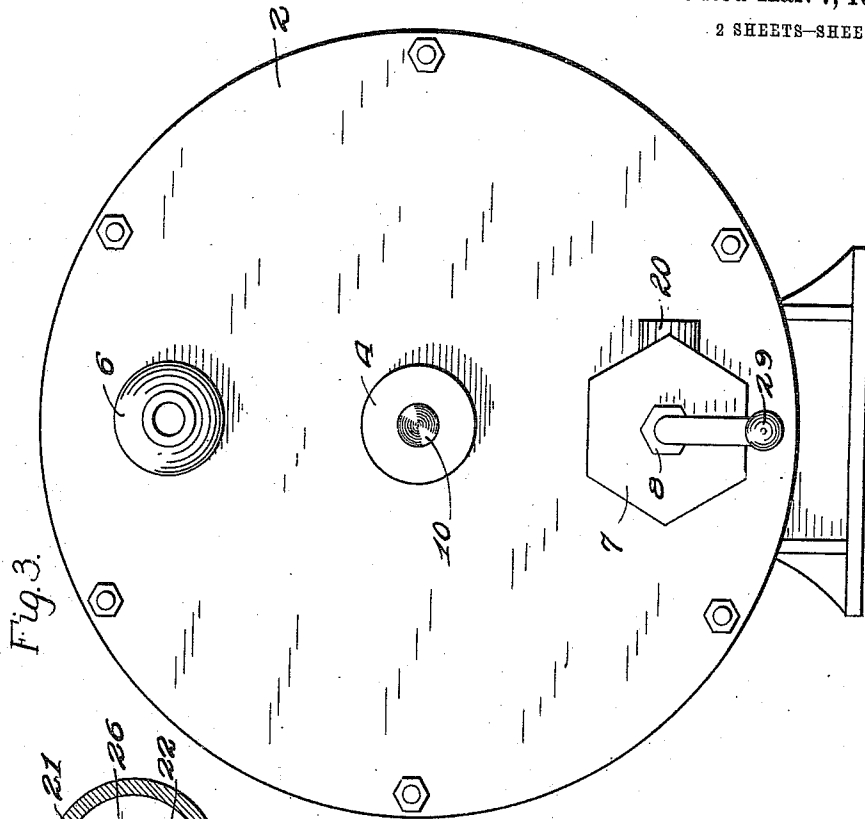


Fig. 3.

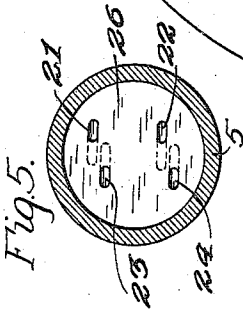


Fig. 5.

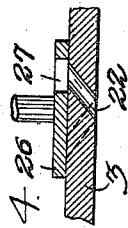


Fig. 4.

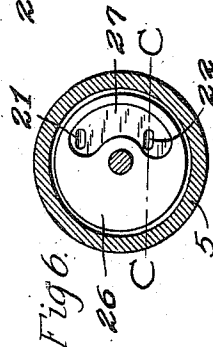


Fig. 6.

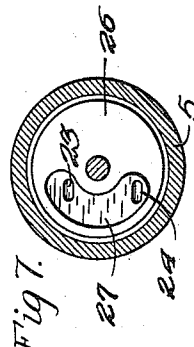


Fig. 7.

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UNITED STATES PATENT OFFICE.

CHRISTOPHER F. LAUFER, OF RICHMOND, CALIFORNIA.

STEAM-ENGINE.

986,016.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed May 31, 1910. Serial No. 564,135.

To all whom it may concern:

Be it known that I, CHRISTOPHER F. LAUFER, a citizen of the United States, residing at Richmond, in the county of Alameda and State of California, have invented certain new and useful Improvements in Steam-Engines, of which the following is a specification.

This invention relates to rotary steam engines and has for its object to provide a simple form of construction for a rotary steam engine which will be effective in operation and which is composed of a small number of parts.

The invention further has for its object to provide an improved rotary engine so constructed and arranged that it may readily be reversed.

With these and other objects in view, the invention consists of an improved rotary engine and in details of construction thereof as hereinafter set forth and claimed, such construction being subject to variations in design and construction but one preferred form and arrangement thereof being set forth in the accompanying drawings and specification.

Referring to the accompanying drawings:—Figure 1 is a view in vertical cross section on line B—B of Fig. 2 of a rotary steam engine constructed in accordance with this invention. Fig. 2 is a face view in elevation of the engine taken on the line A—A of Fig. 1 showing the internal construction of the engine. Fig. 3 is a face view in elevation of the engine showing the structure in Fig. 2 with a cover placed over it. Fig. 4 is a detail view in transverse section on the line C—C of Fig. 6 showing the portion of the reversing valve and cover. Fig. 5 is a detail view in cross section on the line D—D of Fig. 1 of the steam chest with the reversing valve removed. Fig. 6 is a detail view in transverse section on the line D—D of Fig. 1 of the steam chest showing the reversing valve. Fig. 7 is a detail view in transverse section on the line D—D of Fig. 1 showing the valve reversed.

In carrying out the invention the engine is constructed with a narrow cylindrical casing 1 having one side open and provided on its periphery with a lateral flange 2. The casing 1 is closed by means of a cover 3 which bears and fits tightly against the flange 2 of the casing 1, cover 3 being formed with a hub 4, a steam chest 5 projecting

therefrom and an exhaust chamber 6. The steam chest 5 is closed by means of a detachable cover 7 which is screwed into one end of the steam chest and is provided with a stuffing box and gland 8. Located in the casing 1 and fitting against the cover 3 is a rotary piston 9 in the form of a disk, and mounted on the rotary shaft 10 and secured thereto by means of a key 11, said shaft extending through a thimble 12 mounted on the hub 13 of the casing 1 and through a nut 14 secured on the hub 13, the wear between the surface of the cover 3 and the piston 9 being taken up by means of the thimble 12 and a nut 14. The nut 15 screwed on to the hub 13 holds the nut 14 from being jarred loose. The piston 9 is formed with two circumferential sets of cavities or steam chambers 16 and 17 arranged in two circumferential rows, one inside the other, the chambers or pockets 16 forming the outer row and chambers or pockets 17 forming the inner row. The cover 3 is formed with two circumferential rows of pockets 18 and 19 opposite the pockets 16 and 17, the pockets 18 being opposite the pockets 16 and the pockets 19 being opposite the pockets 17. The contacting faces of the cover 3 and casing 1 are ground so as to form a steam tight joint.

Steam enters the engine from the opening 20 in the steam chest 5 and then through passage ways 21 and 22 or 23 and 24 to pockets 16 and 17 from where the steam is exhausted through the ports 25 to the exhaust chamber 6. The openings 21 and 22, 23 and 24 are drilled at such an angle that the steam passing through at high velocity impinges against any two pockets opposite the passage ways 21 and 22, 23 and 24. The openings 21 and 22 are at the same angle as 23 and 24 are, but in the opposite direction so that the steam passing therethrough impinges against the opposite side of the wall thereby causing the rotation of the cylinder in the opposite direction. Within the steam chest 5 is located a reversing valve 26 in the form of a disk having an opening 27 of such a shape that as it is rotated it may cover over the openings 21 and 22 or 23 and 24, allowing the steam to enter the pockets opposite said passage ways so as to cause the cylinder to rotate in one direction or the other according to the location of the rotary valve 26. When the valve 26 is moved to the position shown in Fig. 6 steam is ad-

mitted to the passage ways 21 and 22 and the passage ways 23 and 24 are closed. The valve 26 is rotated by means of a shaft 28 extending through the stuffing box and gland 5 8 and is operated by a crank handle 29. When the valve 26 is in the position shown in Fig. 7 steam is admitted through the passage ways 23 and 24 and the passage ways 21 and 22 are closed.

10 It will readily be seen from the foregoing description that accordingly as the valve 26 is positioned over the passage ways 21 and 22 and 23 and 24 steam will be admitted from the steam chest to the piston and 15 will impinge against one of the bridges 30 between the pockets of the piston and accordingly as it is controlled by the valve and impinges against one set or the other of said bridge walls the piston is caused to rotate 20 in one direction or the other. For example, if the steam admitted strikes against the bridge wall 30 on one side to cause the piston to move in the direction of the arrow and by the time that the succeeding bridge 25 wall covers the opening 21 the piston moving forward allows the steam in the pocket to expand into the pocket ahead and from that to the next preceding one until the exhaust ports 25 are reached. The reverse action 30 takes place when the valve has been moved to cover one side and uncloses the other sets of passage ways.

Having described the invention I claim:—

35 1. In a rotary steam engine of the character described, a disk shaped cylinder having an open side, a cover fitting over said

cylinder and having on one side a steam chamber, and on the other side an exhaust chamber, a rotary valve in said steam chamber, sets of steam ports connecting said 40 chamber with the cylinder, sets of exhaust ports connecting the exhaust chamber with the cylinder, and a disk shaped rotary piston located in said cylinder and having concentric circumferentially arranged sets of 45 steam pockets adapted to communicate with said steam ports and with said exhaust ports.

2. In a rotary steam engine of the character described, a disk shaped cylinder having an open side, a cover extending over 50 said opening secured to said cylinder and formed with a steam chest having sets of steam ports communicating with said cylinder, and an exhaust chamber formed with 55 exhaust ports communicating with said cylinder, a disk shaped rotary piston formed with concentric circumferentially arranged sets of steam pockets opened at one side adjacent to said cover and movable over said 60 steam ports and said exhaust ports and a manually operated valve located in said steam chamber and movable over said steam ports to alternately open and close said sets of steam ports thereof whereby the rotation 65 of the piston is reversed.

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

CHRISTOPHER F. LAUFER.

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