

No. 752,056.

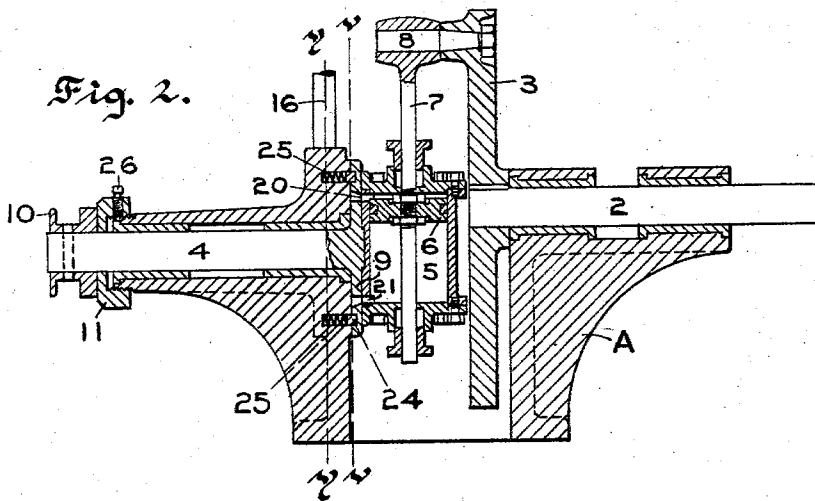
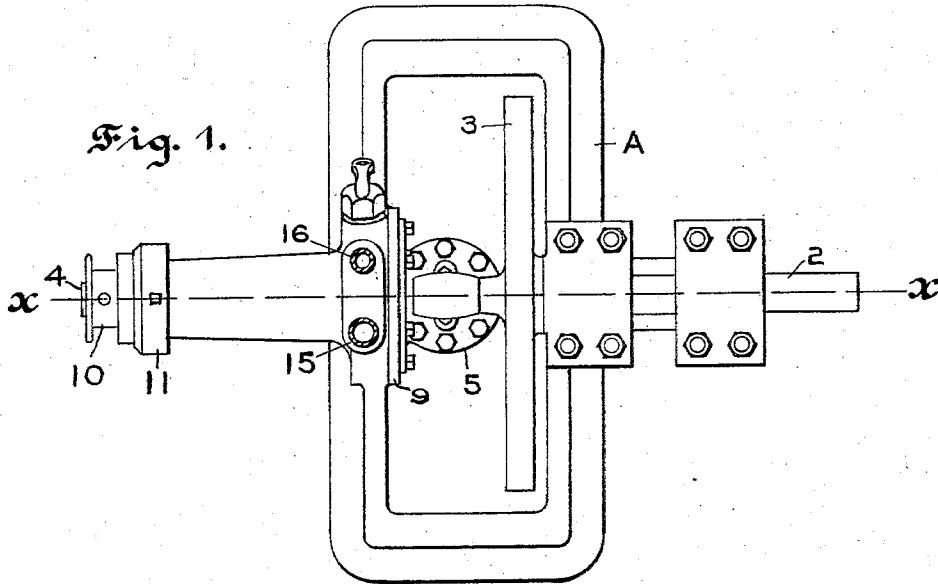
PATENTED FEB. 16, 1904.

C. FISHER.  
ENGINE.

APPLICATION FILED MAR. 23, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses,  
*W. H. Palmer*  
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Inventor,  
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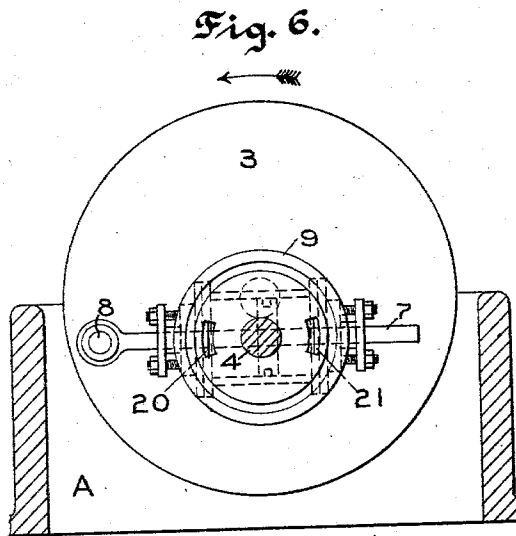
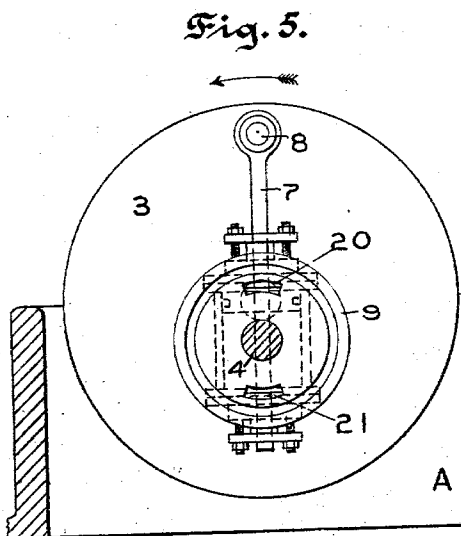
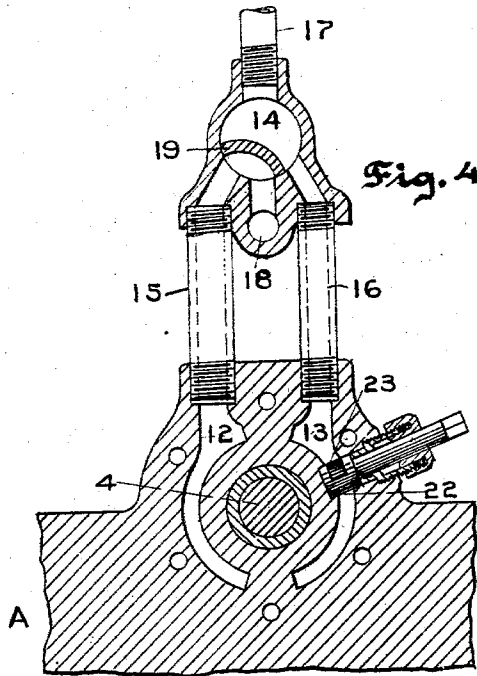
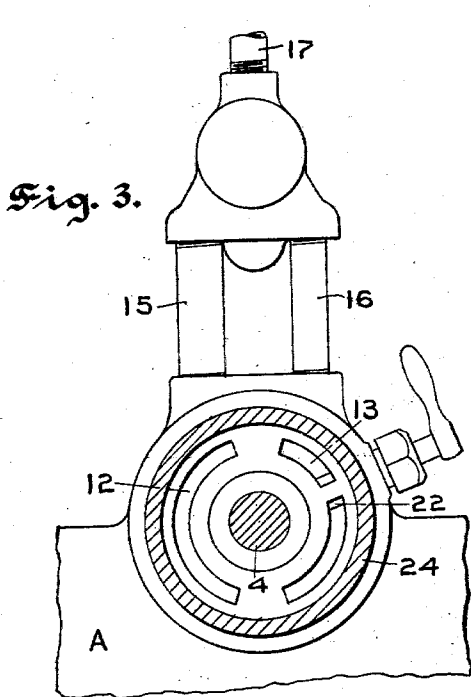
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses,  
W. H. Palmer.  
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Inventor,  
Charles Fisher.  
By *John Johnson*  
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# UNITED STATES PATENT OFFICE.

CHARLES FISHER, OF STILLWATER, MINNESOTA, ASSIGNOR OF ONE-HALF TO VERNE L. SWAIN, OF STILLWATER, MINNESOTA.

## ENGINE.

SPECIFICATION forming part of Letters Patent No. 752,056, dated February 16, 1904.

Application filed March 23, 1903. Serial No. 149,105. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES FISHER, a citizen of the United States, residing at Stillwater, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Engines, of which the following is a specification.

My invention relates to improvements in engines, its object being particularly to provide a reciprocating-piston rotary-cylinder engine combining the advantages of a reciprocating and a rotary engine.

To this end my invention consists in the features of construction and combination hereinafter particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a top plan of my improved engine. Fig. 2 is a section on line *x x* of Fig. 1. Fig. 3 is a section of the engine upon line *v v* of Fig. 2 looking toward the inlet-ports. Fig. 4 is a similar section on line *y y* of Fig. 2, and Figs. 5 and 6 are sections on line *v v* with the packing-ring removed and looking toward the piston.

In the drawings, A represents the framework of the engine. Journaled in one side of the frame is a horizontal shaft 2, carrying upon its inner end a crank-disk 3. Journaled in the opposite side of the engine below the shaft 2 is a shaft 4, upon the inner end 9 of which is supported a steam-cylinder 5. Within the cylinder 5 is slidably arranged an ordinary piston 6, connected by a piston-rod 7 with a pin 8, secured to one edge of the disk 3. Secured upon the outer end of the shaft 4 is a pulley 10, and interposed between the pulley 10 and the side of the engine is a nut 11, loosely mounted upon the shaft and having threaded connection with the engine-framework. Thus as the nut 11 is unscrewed it will engage with the pulley 10 to draw the shaft outward and take up wear, the nut being held in adjusted position by a set-screw 26.

Formed in the side wall of the engine adjacent to the shaft 4 are ports 12 and 13, said ports being connected with a throttle-valve chamber 14 by pipes 15 and 16. The throttle-valve chamber 14 is connected with a source of steam-supply by a pipe 17 and with the

atmosphere by an exhaust-port 18. Arranged within the chamber 14 is a valve 19, which may be turned, as illustrated in Fig. 4, to connect either of the pipes 15 and 16 with the inlet steam-pipe and the opposite pipe with the exhaust-port or may be turned to throttle both said pipes.

As illustrated in Figs. 5 and 6, the cylinder is provided with ports 20 and 21 in its opposite ends, which extend through the disk end 9 of the shaft 4 and which register with the ports 12 and 13 in the operation of the engine. Arranged in the port 13 is a cut-off valve 22, provided with a transverse opening 23, whereby said valve 22 may be turned to cut off the portion of the port 13 below the valve or by means of its opening 23 permit passage of steam through the entire port.

Interposed between the side wall of the engine and the disk end 9 of the shaft 4 is a packing-ring 24, held in its groove by springs 25.

Operation: We will assume that the parts are in the position indicated in Fig. 5, in which position the inlet-ports 20 and 21 of the steam-cylinder stand intermediate of the ports 12 and 13 or in dead-center position. By turning the crank-disk 3 in the direction indicated by the arrow the port 20 will be brought into communication with the inlet steam-port 13. The steam passing from the inlet-port 13 through the port 20 into the cylinder will actuate the piston, drawing the piston-rod through the cylinder and turning the disk. By comparing Figs. 5 and 6 it will be seen that the above-described movement of the piston will rotate the crank-disk on account of the supporting-shafts of the disk and cylinder being out of alinement a distance equal to one-half of the stroke of the piston. The continued rotation of the crank-disk will bring the port 20 into communication with the exhaust-port 12 and the port 21 into communication with the inlet-port 13. By this time the piston has reached the opposite end of the cylinder, and during the next half of the cylinder the return movement of the piston will take place. The crank-disk is large enough to act as a fly-wheel to carry the engine over dead-center.

The advantages of the engine over an ordinary reciprocating-piston engine are its high speed and power on account of there being no weight to start and stop, economy on account of the cut-off taking place very close to the piston, which makes a small clearance, and durability on account of the large wearing-surface of journals and on account of being in perfect balance.

By means of the valve 19 the port 12 may be turned into inlet and the port 13 into exhaust port to reverse the operation of the engine. By means of the valve 22 in the port 13 the length of said port may be shortened to cut off the admission of steam into the cylinder.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an engine of the class described, the combination of a pair of separated shafts arranged parallel and out of alinement, a crank-disk supported upon the inner end of one shaft, a cylinder supported upon the inner end of the other shaft, said cylinder being provided with ports in its opposite ends, a piston slidable in said cylinder, a connection between said piston and the edge of said crank-disk, a pair of curved ports in the adjacent wall of the engine in line with said cylinder-ports, a cut-off valve

in one of said curved ports, conduits connecting said ports with a source of steam-supply and with an exhaust-port, and a throttle-valve arranged in connection with said conduits and exhaust-port.

2. In an engine of the class described, the combination of a pair of separated shafts arranged parallel and out of alinement, a crank-disk supported upon the inner end of one shaft, a disk 9 constituting the inner end of the other shaft, a cylinder supported upon the face of said disk 9, said cylinder being provided with ports in its opposite ends registering with ports through the disk 9, a piston slidable in said cylinder, a piston-rod connecting said piston with the edge of said crank-disk, a pair of curved ports in the adjacent wall of the engine in line with the ports extending from the cylinder through the disk 9, conduits connecting said curved ports with a source of steam-supply and with an exhaust-port, and valves arranged in connection with said conduits and ports.

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

CHARLES FISHER.

Witnesses:

H. S. JOHNSON,  
EMILY F. OTIS.