(No Model.) 2 Sheets—Sheet 1.

C. G. RUTHS.

REVOLVING CYLINDER ENGINE.

No. 456,315. Patented July 21, 1891.

FIG. 1.

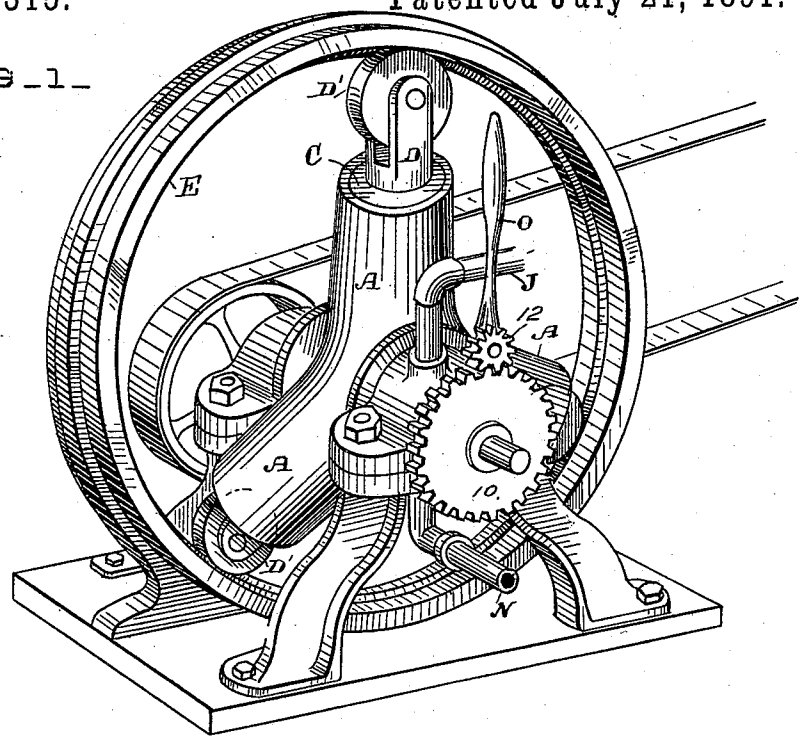
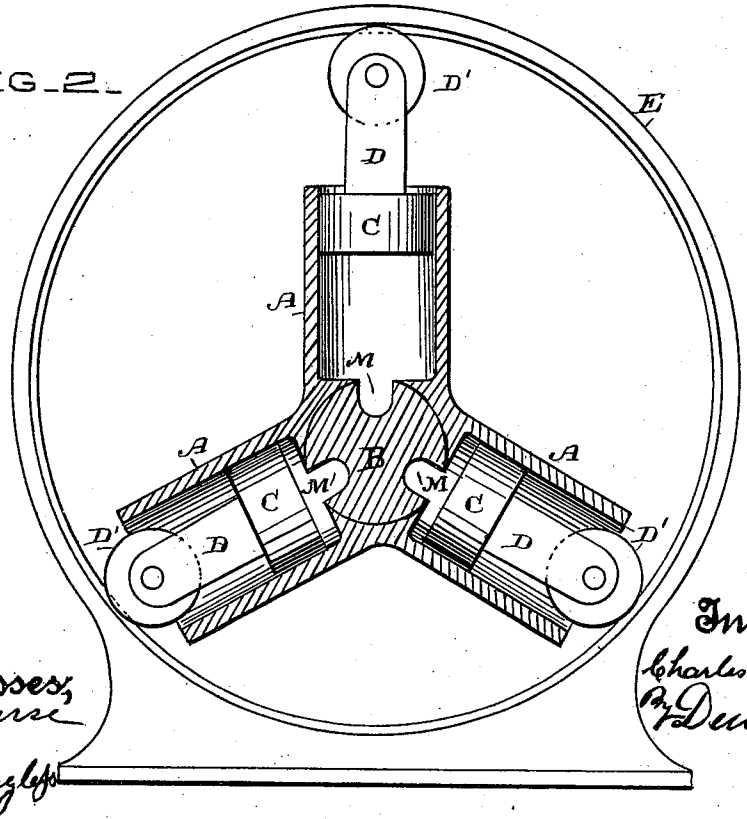


FIG. 2.



Witnesses,
F. Howson
J. A. Bagley

Inventor
Charles G. Ruths
By Dewey & Co.
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

C. G. RUTHS.

REVOLVING CYLINDER ENGINE.

No. 456,315. Patented July 21, 1891.

FIG. 3.

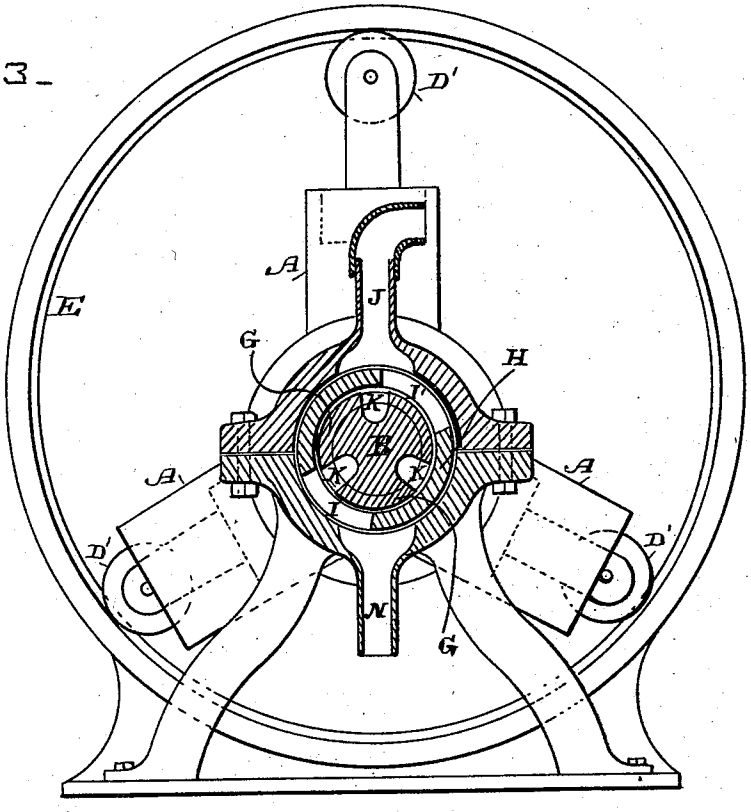
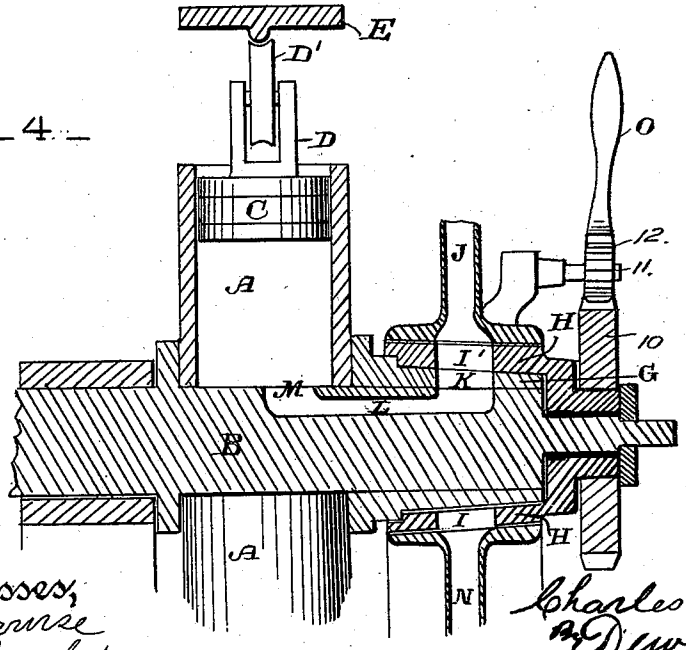


FIG. 4.



Witnesses;
J. A. Bayles

Inventor
Charles G. Ruths
by Dewey & Co.
attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES G. RUTHS, OF SAN FRANCISCO, CALIFORNIA.

REVOLVING-CYLINDER ENGINE.

SPECIFICATION forming part of Letters Patent No. 456,315, dated July 21, 1891.

Application filed December 2, 1890. Serial No. 373,505. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. RUTHS, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Revolving-Cylinder Engines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the novel construction of what I term a "revolving-cylinder engine;" and my invention consists of the construction and combination of devices, which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is an exterior view of my engine. Fig. 2 is a transverse section taken through the cylinders. Fig. 3 is a transverse section taken through the valve and reversing mechanism. Fig. 4 is a vertical section taken in the plane of the axis of the shaft and one cylinder, showing the steam and exhaust passages.

A A are the cylinders, of which there should be preferably three or more. These cylinders should be fixed so as to radiate from a central shaft B, and this shaft is journaled horizontally, so as to rotate within its journal-boxes. The outer ends of the cylinders may be open, and within the cylinders are fitted the pistons C, having the piston-rods D extending outwardly, and upon the outer ends of these piston-rods are fixed the anti-frictional shoes or rollers D'.

E is a ring fixed upon a base and surrounding the cylinders and shaft, so that the latter is eccentric to the interior periphery of the ring. The position of the shaft with reference to the ring is such that when either cylinder stands with its end downward below the shaft its piston will be forced into the inner end of the cylinder by reason of the contact of the anti-frictional shoe with the periphery of the ring at a point where said ring is nearest to the shaft upon which the cylinders are fixed. From this point the distance gradually increases until the cylinder is at the top or above the shaft, when its piston will have gradually moved out until it is at the outer end of its stroke, the shoe at the end of the piston-rod remaining in contact with the interior periphery of the stationary eccentrically-mounted ring.

It will be manifest from this construction that whenever steam is admitted into either of the cylinders after it has passed its lowest point, where it is nearest to the periphery of the ring, the pressure upon the piston, forcing it and the piston-rod against the interior of the eccentric ring, will cause the shaft upon which the cylinder is mounted to rotate, the piston gradually moving outward until it has reached the opposite point, where the piston is at the greatest distance from the center. Several of these cylinders being mounted upon the same shaft, each one takes steam successively as it passes this nearest point, and thus the operation is continuous.

In the present case I have shown the rotary shaft as mounted nearest to the encircling ring at the bottom; but it will be manifest that the shaft and ring may be fixed with reference to each other so that their point of nearest approach will be at any desired point of the circumference.

Within one of the journals upon which the shaft revolves I have shown a collar G, through which the shaft extends and within which it is fixed. This collar is made slightly tapering, like the plug of a faucet, and exterior to it is a sleeve H, the interior of the sleeve and the exterior of the collar being correspondingly shaped and ground, so as to make a tight-fitting joint.

The sleeve H has openings or ports I I', made through it upon opposite sides, and the sleeve is fitted and ground to turn steam-tight within the journal-box. Into one side of the journal-box steam is admitted through the pipe N and to the opposite side is connected the exhaust-pipe J. The sleeve H has a gear 10 upon its outer end and the lower end of a handle O, fulcrumed upon a stud 11, is provided with a pinion or segment 12, adapted to mesh with the gear. It will thus be seen that as the handle is moved to either side the sleeve H will be correspondingly turned and the steam and exhaust ports shifted to one side or the other, thus changing the point of admission to the cylinders to one side or the

other of the shortest radius of the fixed ring within which the cylinders revolve and by which they are moved.

The collar G, which is fixed to the shaft, has ports K made through it and communicating with channels L, which extend horizontally within the shaft to a point where they communicate with ports M, made at the inner ends of the cylinders A. It will be manifest that the shaft may have the ports K made directly in it, but the use of the collar makes the construction easier.

The operation then will be as follows: The sleeve H being turned so that one of its ports is in the position to admit the steam from the steam-pipe, it will be manifest that as the shaft, with the cylinders mounted upon it, is moved to such a point that steam may be admitted through the collar G it will pass into one of the cylinders as it passes over this port, and expanding in the cylinder will force the piston outward. The action will be similar to that of an inclined plane, the anti-frictional shoe or roller upon the outer end of the piston-rod traveling over the eccentric ring, which gradually increases in distance from the point where steam is first admitted until the cylinder has arrived at the point nearly opposite, and which is at the greatest distance from the central cylinder-shaft, when the piston will have reached the outer end of the cylinder and the termination of its stroke in that direction. The following cylinder will meantime have arrived at the proper point to receive steam, and consequently two cylinders will be receiving steam at all times and acting to rotate the shaft. As soon as the cylinder has passed the vertical point, where its piston is at the outer end of the stroke, the piston will be again forced inward by the gradual approach of the eccentric ring to the shaft, and at this instant the port M of that cylinder will be in communication through the passage L and port K with the exhaust-port I′ of the sleeve H, so that steam will be allowed to pass out of the cylinder as the piston again approaches the central point. For ordinary work, where the engine only runs in one direction, the sleeve H may be fixed at such a point as will properly admit and exhaust the steam from the cylinders; but if the engine is to be used as a reversible one the sleeve is made movable by the handle before described, and when it is desired to reverse the engine the sleeve is turned so that the web between the two ports I and I′ will first cover the steam-admission pipe or passage, and thus cut off the supply and stop the engine. A further movement of the sleeve will bring the port I′ into position to admit steam, so that it will pass into the cylinders in such a manner as to cause them to revolve in the opposite direction, and the port I will by the same movement be brought into position to communicate with the exhaust-pipe J.

By this construction I provide a very simple and economically-operating engine which is available for many kinds of work where but little space is available for the engine.

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

In an engine, the cylinders mounted radially upon a shaft which is journaled to rotate in boxes, a circular ring fixed eccentrically to said shaft in the plane of rotation of the cylinders, pistons fitting said cylinders and having piston-rods with anti-frictional shoes or rollers traveling in contact with the inner periphery of the ring, whereby the pistons are reciprocated within their cylinders during each rotation of the shaft, steam and exhaust pipes connecting with one of the journal-boxes in which the shaft rotates, a removable collar fixed to the shaft having ports made through it radially, and passages leading from these ports to corresponding openings in the inner ends of each of the cylinders, in combination with a sleeve inclosing the collar and fitting within the journal-box of that end of the shaft having ports made radially through it corresponding with those in the axle-collar, a toothed gear fixed to the outer end of the movable sleeve, and a pinion engaging said gear having a lever or handle connected with it, whereby it and the gear may be turned and the position of the sleeve altered, substantially as herein described.

In witness whereof I have hereunto set my hand.

CHARLES G. RUTHS.

Witnesses:
S. H. NOURSE,
J. A. BAYLESS.