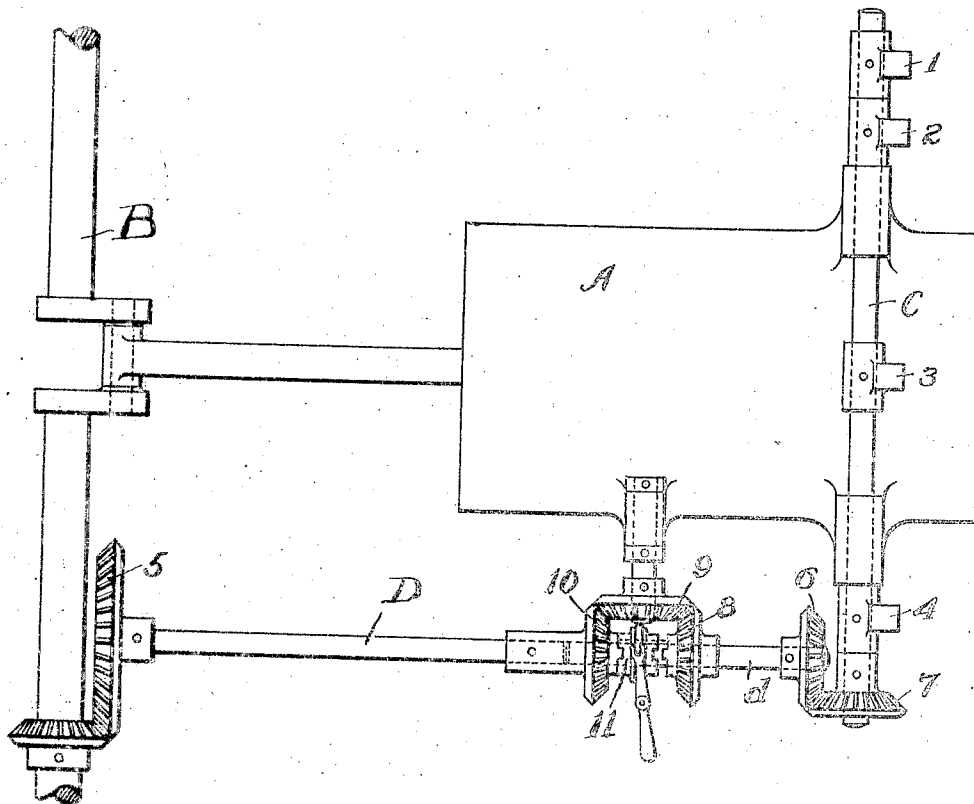


D. SCHLEGEL.
 REVERSING GAS ENGINE.
 APPLICATION FILED MAR. 10, 1909.

964,564.

Patented July 19, 1910.



Daniel Schlegel,
 Inventor

Witnesses

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By

[Signature]

Attorney

UNITED STATES PATENT OFFICE.

DANIEL SCHLEGEL, OF DRYVILLE, PENNSYLVANIA.

REVERSING GAS-ENGINE.

964,564.

Specification of Letters Patent. Patented July 19, 1910.

Application filed March 10, 1909. Serial No. 482,492.

To all whom it may concern:

Be it known that I, DANIEL SCHLEGEL, a citizen of the United States, and a resident of Dryville, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Reversing Gas-Engines, of which the following is a specification.

My invention relates to explosive engines in which the operating valves and sparking mechanism are operated as required by a cam-shaft driven by the engine; and my object is to provide in a simple manner for reversely operating the engine when desired.

The invention is described in connection with the accompanying drawings and is specifically pointed out in the claim.

The figure is a diagrammatic plan view of an engine having my invention applied thereto.

A indicates the cylinder of an ordinary gas or gasoline engine; B the crank shaft thereof; C a cam shaft arranged parallel with the crank shaft and provided with suitable cams, as 1, 2, 3, 4, set for properly operating the usual inlet and exhaust valves and sparking mechanism (not shown); and D is a connecting drive shaft having at one end a gear wheel 5 through which rotary motion is imparted thereto from the engine shaft B, and at the other end a gear wheel 6 meshing with a gear wheel 7 on the cam shaft C; all of these elements being commonly employed in gas engine constructions.

The cam shaft C with its attachments, is adapted, when rotated in determined direction by the engine shaft, to operate the usual connected valves and sparking mechanism in proper time to effect the required control of the fuel, the exhaust gases, and the point of ignition.

In my preferred construction, as indicated in the drawing, I divide the drive shaft D at a convenient point in its length, so that the main portion thereof, which is operated by the engine shaft B, will be rotated in one direction or the other according as the engine is run forward or backward; while the outer portion *d* thereof, which carries the gear wheel 6 operating the cam shaft C, is free to be rotated always in one direction; that is either with the main portion of the shaft or in reverse direction.

To provide for thus driving the cam shaft uniformly from reverse rotations of the engine, I fix the gear wheel 6 to the portion *d* of the drive shaft, but provide on the latter a loose bevel gear 8 arranged in gear through a suitably mounted idler 9, with a bevel gear 10 fixed to the outer end of the main drive shaft portion D; and I arrange to drive the shaft portion *d* (with its fixed gear 6) either in the same direction as the main drive shaft D or in reverse direction, as desired, by employing a rotary clutch sleeve 11 on the shaft portion *d*, adapted to be thrown into engagement either with the bevel gear 10 or with the bevel gear 8. When the clutch is in engagement with gear 10, the shaft portion *d* (with its fixed gear 6) will be rotated directly and in the same direction as the main portion D, the gear 8 being then rotated loosely by the idler 9; while when the clutch is thrown into engagement with the gear 8 so as to fix said gear to the shaft portion *d*, the latter will be rotated indirectly and in reverse direction from the main portion D. Thus the cam shaft C will be rotated in the same direction, and the connected mechanisms operated in the same times, whichever way the engine is run, the clutch sleeve 11 being merely moved to provide for a reversal of the engine. If the ignition point is not timed to occur at the end of the piston movement, proper adjustment can be readily made.

What I claim is—

In a gas engine having a crank shaft with a bevel gear fixed thereto, and a parallel cam shaft with a bevel gear fixed thereto, a reversing drive mechanism comprising a drive shaft D provided at opposite ends with bevel gears 5 and 6 arranged in mesh respectively with said crank shaft and cam shaft gears, and intermediately with a clutch mechanism whereby said bevel gear 6 is adapted to be always rotated in the same direction by either forward or backward rotation of the crank substantially as set forth.

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

DANIEL SCHLEGEL.

Witnesses:

VESTA I. V. SCHADE,
SARAH BRINTZENHOFF.