Sept. 8, 1925. 1,553,009

E. STUKE

ENGINE

Filed July 23, 1923

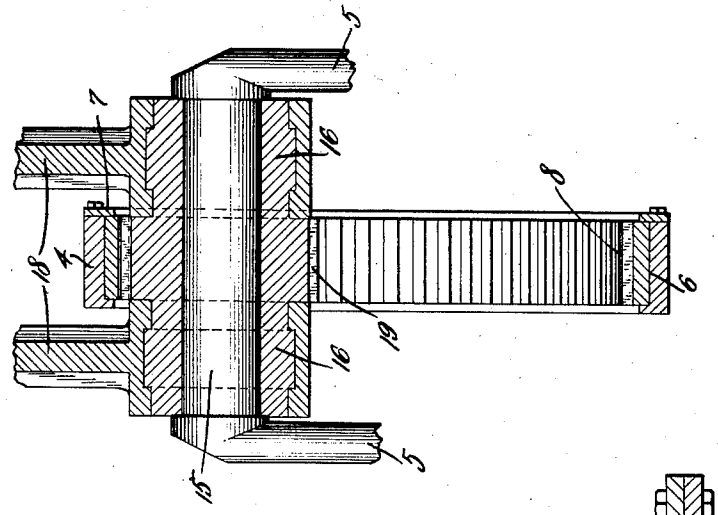


Fig. 2.

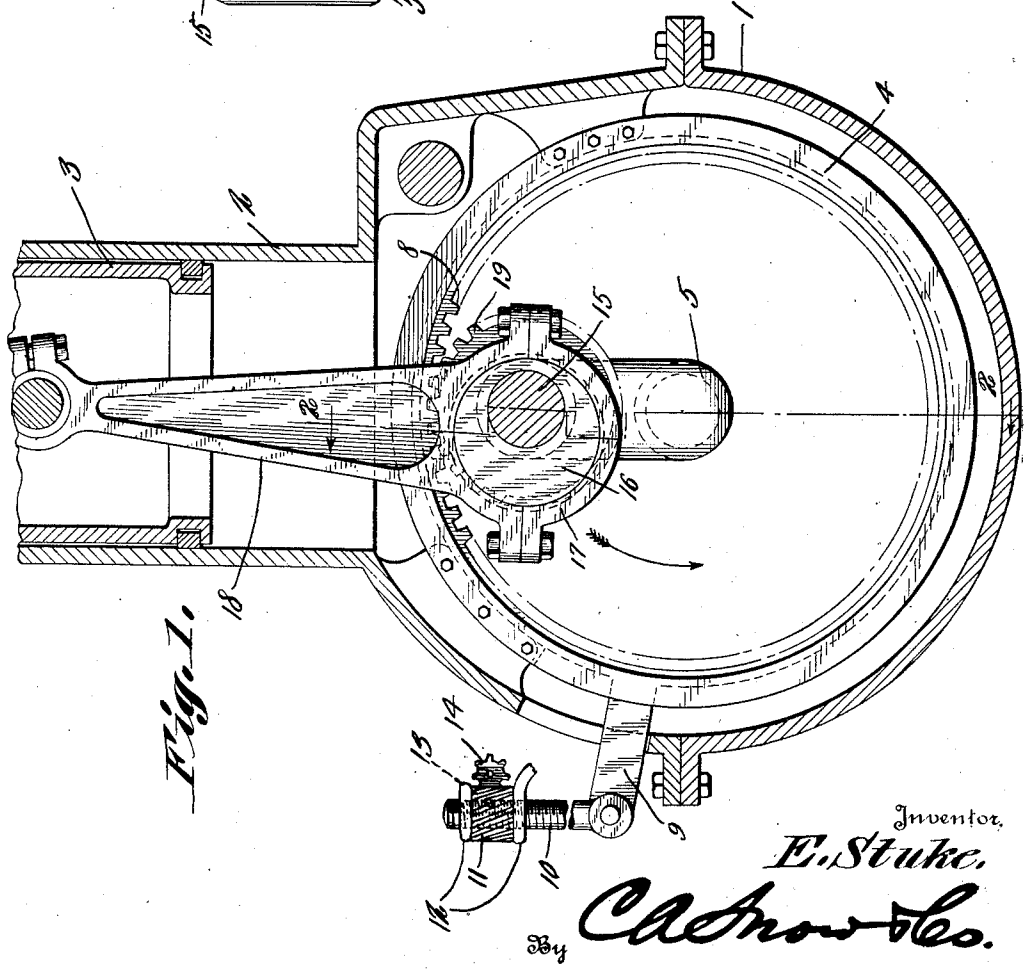


Fig. 1.

Inventor,
E. Stuke.
By C. A. Snow & Co.
Attorneys

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UNITED STATES PATENT OFFICE.

ERNEST STUKE, OF MERIDIAN, MISSISSIPPI.

ENGINE.

Application filed July 23, 1923. Serial No. 653,355.

To all whom it may concern:

Be it known that I, ERNEST STUKE, a citizen of the United States, residing at Meridian, in the county of Lauderdale and State of Mississippi, have invented a new and useful Engine, of which the following is a specification.

This invention relates to engines of the type utilizing reciprocating pistons. Heretofore the construction and operation has been such that the point of highest compression has been reached simultaneously with the arrival of the piston rod at the dead center. Thus there has been a considerable loss of power because of the waste of the initial force of the explosion.

It is an object of the present invention to provide means whereby the crank shaft and the piston connected thereto are caused to travel in the same general direction during the greater portion of the compression stroke and in opposite directions during a minor portion of the stroke so that the final compression is effected after the crank has passed the dead center.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawing the preferred form of the invention has been shown.

In said drawings

Figure 1 is a section through a portion of an engine having the present improvements combined therewith.

Fig. 2 is a section on line 2—2, Fig. 1.

Referring to the figures by characters of reference 1 designates the crank case of an engine provided with a cylinder 2 in which a piston 3 is mounted for reciprocation.

Secured within the crank case so as to be fixed relative thereto is a circular guide 4 concentric with the crank shaft 5 and having a channel 6 in its inner circumference one wall of which is formed preferably by a detachable ring 7. Mounted for angular adjustment in the guide 4 is an internal gear 8 likewise concentric with the crank shaft 5. This gear has a radial arm 9 to which is pivotally connected a screw 10. A nut 11 is mounted on the screw and is held against longitudinal movement by spaced stationary collars 12. This nut has spiral threads on its outer surface as indicated at 13 for engagement by a worm gear 14. Thus it will be seen that by rotating gear 14 the nut will be rotated and screw 10 will be shifted longitudinally to rotate gear 8 in either direction about its center. The crank 15 of the shaft 5 has a sleeve 16 eccentrically mounted thereon and adapted to rotate relative thereto, the end portions of this eccentric sleeve being engaged by the split collars or eccentric straps 17 provided at one end of the piston rod or rods 18. The middle portion of the eccentric sleeve is provided with a gear 19 that is concentric with the crank 15 and meshes at all times with the internal gear 8.

Obviously during the rotation of the crank shaft in a counter-clockwise direction as indicated by the arrow in Fig. 1 the gear 19 will be given a clockwise rotation. The parts are so proportioned that when the crank 15 reaches the dead center at what would ordinarily be the limit of the compression stroke, the long radius of the eccentric sleeve 16 has not yet reached the upper limit of its movement. Consequently as the crank 15 passes the dead center and begins to move downwardly the rotating gear 19 will cause the eccentric 16 to thrust upwardly against the rod 18 at a greater speed than the downward movement of the crank so that the compression stroke will not be completed until the longest radius of the eccentric is brought into line with the longitudinal axis of the piston rod. This occurs after the dead center has been well passed by the crank and, consequently, when the explosion occurs the full force thereof will be exerted against the crank along lines that will insure full utilization thereof.

While this improvement is especially suited for use in connection with internal combustion engines, it is to be understood that it can also be employed with certain modifications, upon steam engines. Obviously various changes can be made in the construction and arrangement of the parts as heretofore pointed out without departing from the principle disclosed.

By utilizing the adjustable arm 9 the gear 8 can be adjusted angularly so as to advance or retard the point of extreme compression relative to the rotation of the crank shaft.

What is claimed is:—

The combination with the reciprocating piston of an engine and a crank shaft driven thereby, of a normally stationary gear concentric with the crank shaft, a gear rotatable on the crank of the crank shaft and meshing with the normally stationary gear, an eccentric rotatable with the gear on the crank, a connection between the eccentric and piston, said gears, eccentric and connection cooperating to complete the compression stroke of the piston during and following the arrival of the crank at the dead center during the compression stroke of the piston, and means for angularly adjusting the concentric gear to vary the time interval between the arrival of the crank at its dead center and the piston at its point of maximum compression.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

ERNEST STUKE.