D. W. SHORT.

ENGINE.

APPLICATION FILED OCT. 5, 1920.

1,399,666.

Patented Dec. 6, 1921.

2 SHEETS—SHEET 1.

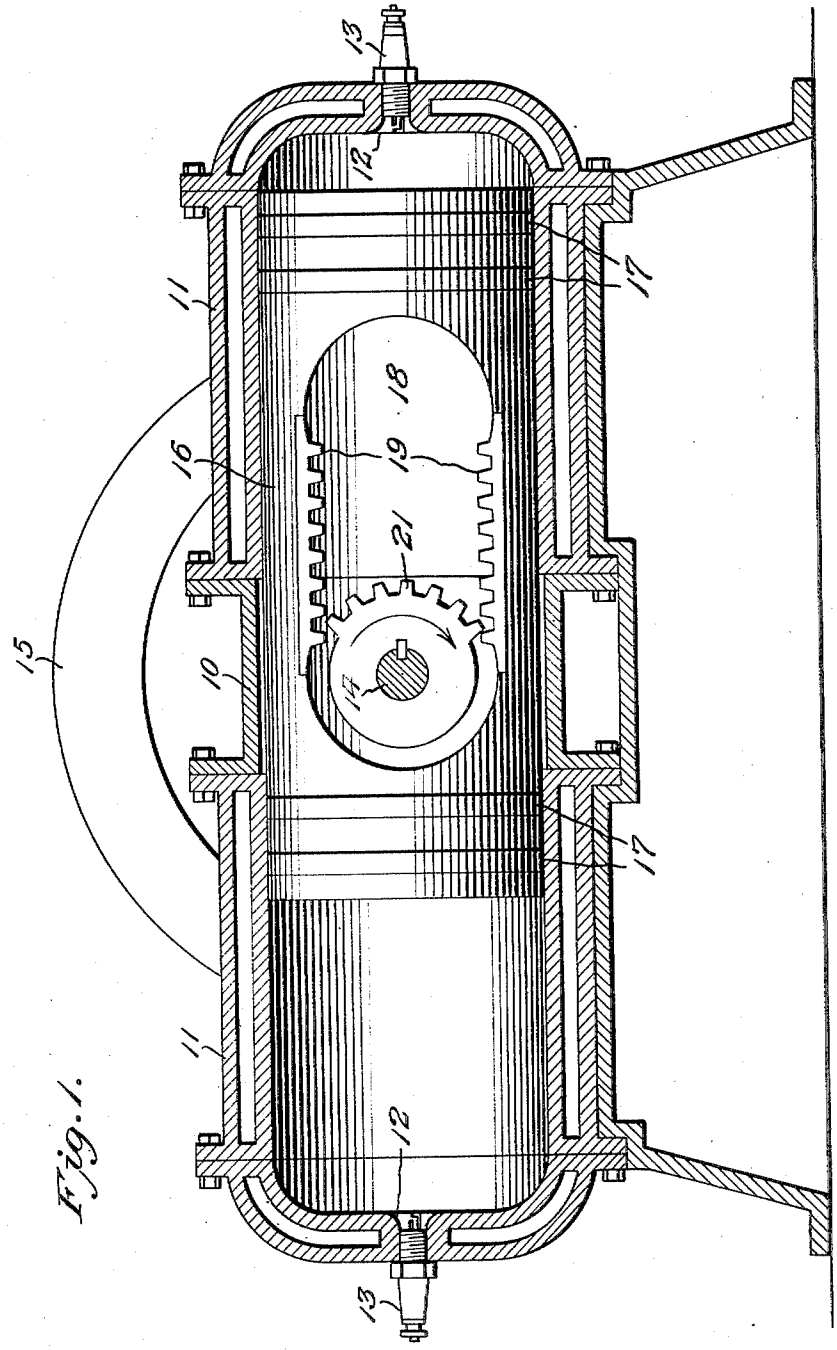


Fig. 1.

Edwin G. McKee
J. M. Jester
WITNESS:

D. W. Short INVENTOR
BY Victor J. Evans
ATTORNEY

D. W. SHORT.

ENGINE.

APPLICATION FILED OCT. 5, 1920.

1,399,666.

Patented Dec. 6, 1921.

2 SHEETS—SHEET 2.

Fig. 3.

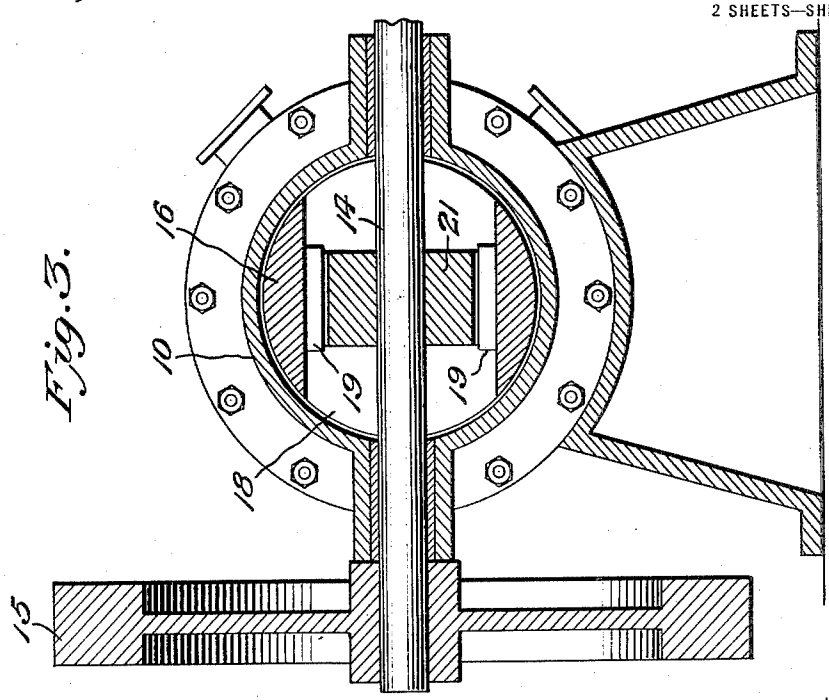
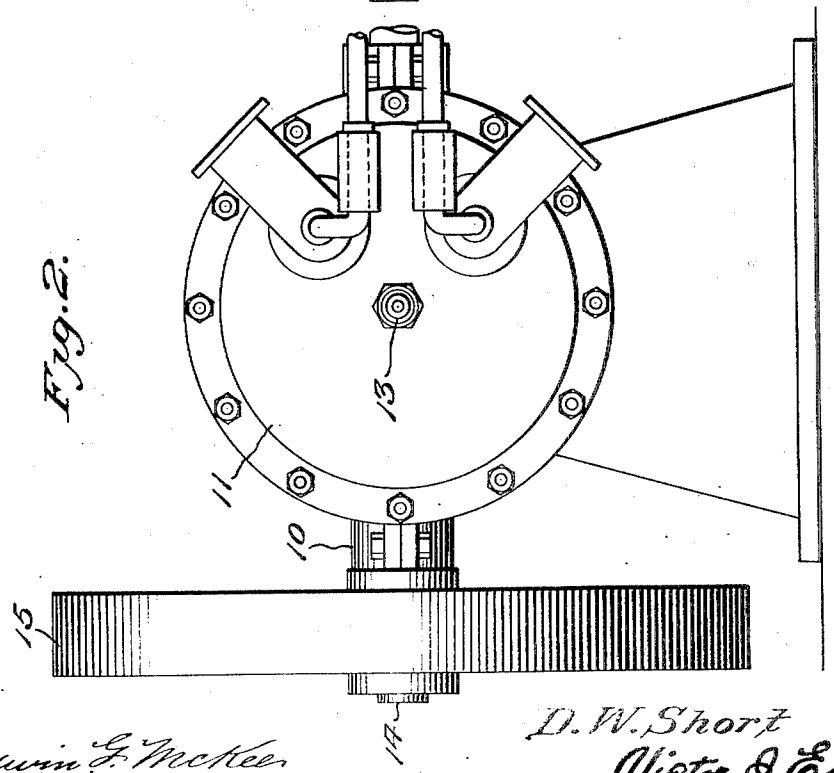


Fig. 2.



Edwin G. McKee
J. M. Jester
WITNESS:

D. W. Short INVENTOR
BY Victor J. Evans
ATTORNEY

UNITED STATES PATENT OFFICE.

DRAPER W. SHORT, OF EMPIRE, OREGON.

ENGINE.

1,399,666. Specification of Letters Patent. Patented Dec. 6, 1921.

Application filed October 5, 1920. Serial No. 414,909.

To all whom it may concern:

Be it known that I, DRAPER W. SHORT, a citizen of the United States, residing at Empire, in the county of Coos and State of Oregon, have invented new and useful Improvements in Engines, of which the following is a specification.

This invention relates to engines, particularly to those of the internal combustion type, and has for its object the provision of an engine having alined cylinders within which is movable a single double-acting piston formed hollow and provided internally with rack teeth meshing with a segmental gear carried by the crank shaft, the piston receiving a power impulse at each end of its stroke whereby there will be no idle strokes.

An important object is the provision of an engine of this character which will be simple and inexpensive in manufacture, efficient in use, powerful in action, durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction to be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which—

Figure 1 is a longitudinal sectional view,

Fig. 2 is an elevation at right angles to Fig. 1, and

Fig. 3 is a cross sectional view.

Referring more particularly to the drawings, the numeral 10 designates a species of crank case from opposite sides of which extend cylinders 11 which may be alined and which are provided at their outer ends with holes 12 into which are screwed the usual spark plugs 13. Only two cylinders are shown but it is readily understood that any desired number are employed. The numeral 14 designates the shaft which carries the usual fly-wheel 15.

I make use of a single piston 16 operating within two cylinders 11 and this piston has both ends formed identically the same and of course provided with the usual packing rings 17. The piston is formed open at its center, as indicated at 18, and has opposite sides of its inner walls formed with racks 19. Secured upon the shaft 14 is a segmental gear 21 which meshes with the racks 19 successively as the piston is reciprocated.

It is of course necessary that some suitable valve mechanism be employed for admitting a charge to and exhausting the burnt gases from the ends of the cylinders at the proper time.

In the operation it will be seen that when the piston is at either limit of its movement, which is at the end of its compression stroke, and the explosion occurs through ignition of the charge by the adjacent plug 13, the piston will be driven to the other limit of its movement whereupon one set of rack teeth 19 will engage the segmental gear 21 and rotate the shaft 14. On the return stroke the other set of rack teeth will engage the gear and this movement is of course continuous as long as explosive fuel is fed to the cylinders and ignited.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed and efficient engine in which the use of cranks, connecting rods and other parts is entirely eliminated so that the utmost simplicity together with the very minimum number of parts is attained.

While I have shown and described the preferred embodiment of my invention, it is of course to be understood that I reserve the right to make such changes in the form, construction, and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:

In an engine, a pair of alined cylinders, sparking members at the outer ends of said cylinders, a shaft journaled between the inner ends of said cylinders, a segmental gear on said shaft, and a single piston mounted for reciprocation within said cylinders and formed open at its central portion, the opening being elongated, the opposite longitudinal walls of said opening being formed with rack teeth meshing with said segmental gear, one set of rack teeth meshing with the gear at one stroke of the piston and the other set meshing with the gear on the opposite stroke.

In testimony whereof I affix my signature.

DRAPER W. SHORT.