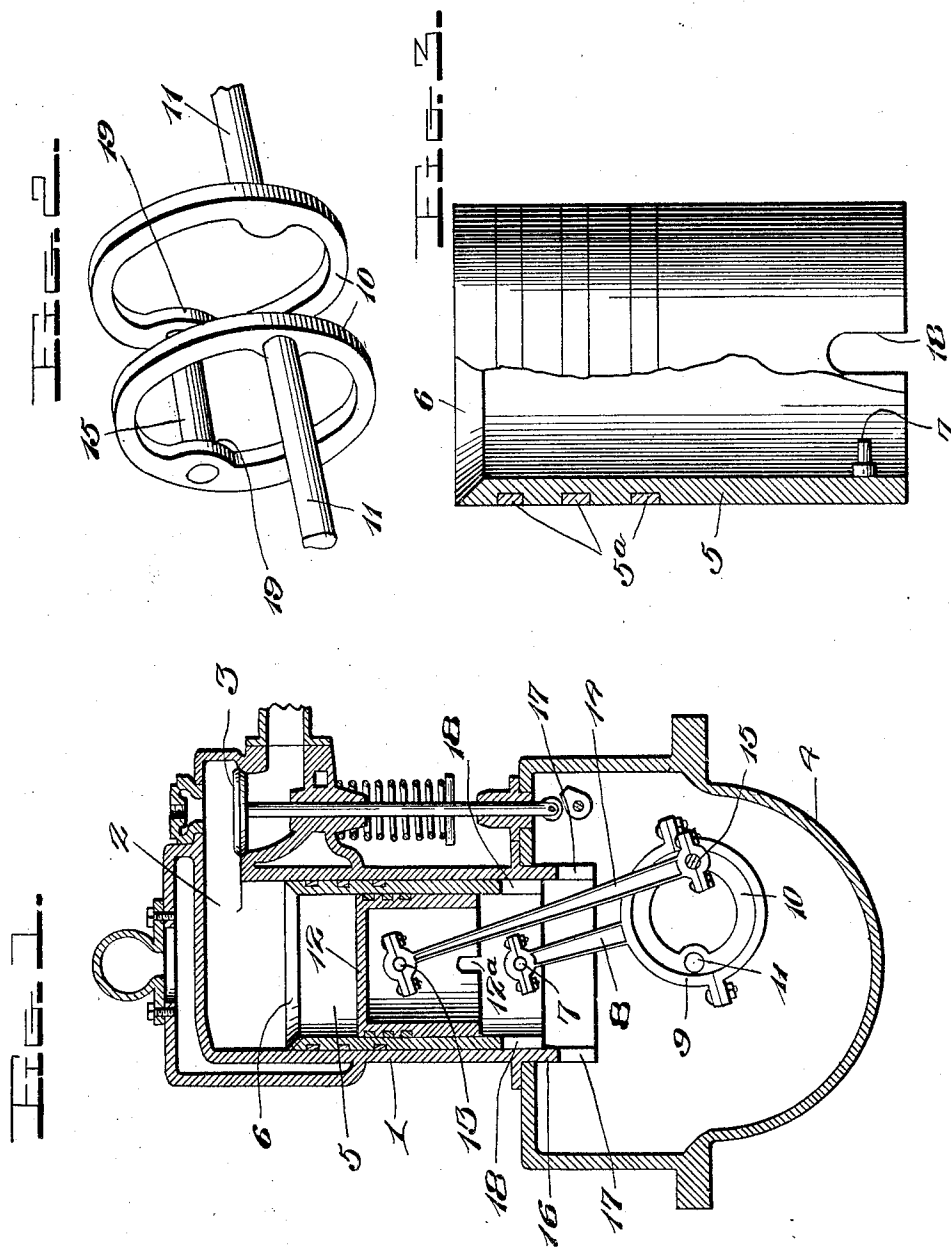


W. I. WHEELER.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED JAN. 30, 1912.

1,062,675.

Patented May 27, 1913.



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WILLIAM I. WHEELER, OF SCOTTVILLE, ILLINOIS.

INTERNAL-COMBUSTION ENGINE.

1,062,675.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM I. WHEELER, a citizen of the United States, residing at Scottville, in the county of Macoupin and State of Illinois, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention comprehends certain new and useful improvements in internal combustion engines of the reciprocating piston type, and the invention has for its primary object a simple construction of engine of this character which embodies a sleeve movable within the working cylinder and a piston movable within the sleeve in the same direction as the sleeve but at a higher rate of speed, whereby a maximum degree of compression is secured and also a relatively long stroke of the piston without proportionately increasing the length of the working cylinder.

The invention also has for its object a simple, durable and efficient construction of internal combustion engine, particularly designed for use in automobiles or similar vehicles, or motor boats and similar vessels, the parts being so arranged, as will be hereinafter more fully referred to, that space will be economized without detracting from the efficiency of the engine. And the invention also aims to generally improve this class of devices and to render them more useful and commercially desirable.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawing, in which:—

Figure 1 is a longitudinal sectional view of an engine embodying the improvements of my present invention, the design of engine shown being selected for the purposes of illustration only. Fig. 2 is a detail perspective view of the drive or crank shaft of the engine; and Fig. 3 is a detail sectional side elevation of the sliding sleeve of the apparatus.

Corresponding and like parts are referred

to in the following description and designated in the accompanying drawing by like reference characters.

Referring to the drawing, wherein is illustrated just so much of an internal combustion engine as is necessary for a clear understanding of my invention, 1 designates the working cylinder of the engine which in the present instance is shown as vertically disposed, 2 designates the compression chamber of the cylinder, 3 the charge admission valve which may be operated in any desired way and be of any desired type and construction, and 4 designates the crank case which may be secured to the cylinder 1 in any preferred manner and which, as will be noted by reference to Fig. 1 is of a relatively large diameter in comparison to the length of the cylinder, so as to provide for the long stroke piston herein- after specifically referred to.

Within the cylinder 1 a longitudinally reciprocating sleeve 5 is mounted, said sleeve being provided with any desired number of packing rings 5^a by which it is caused to snugly fit the interior wall of the cylinder 1 and being formed at its compression end with an inwardly tapering or beveled edge 6 for a purpose hereinafter more fully set forth. At its crank case end, the sleeve 5 is formed with two diametrically opposed inwardly projecting studs or pins 7 to which connecting rods 8 are pivotally connected at one end, said connecting rods being joined at their opposite ends to eccentric straps 9 which are mounted for movement on laterally spaced eccentrics 10 that are secured to the drive or crank shaft 11 journaled in the crank case 4. The straps 9 may be held in any desired way from sidewise displacement.

Within the sleeve 5 is a piston 12, said piston being provided with any desired number and construction of packing rings engaging the inner wall of the sleeve 5 and being provided with a transversely extending rod 13 to which one end of the long stroke connecting rod 14 is pivotally connected. The other end of the connecting rod or pitman 14 is mounted on a crank pin which connects together the two eccentrics 10, as best illustrated in Fig. 2, whereby the crank shaft 11 performs the double function of reciprocating both the sleeve 5 and the piston 12 in the same di-

resection both on the aspirating and compression strokes of the engine. By forming the compression end of the sleeve 5 with the inwardly tapering or inclined edge wall 6, the gases will be permitted to glide into the adjoining end of the sleeve toward the operative face of the piston 12, all abrupt walls being thereby avoided.

In order to provide a proper bearing for the sleeve 5 in its movements in the working cylinder 1, the latter is formed with an annular extension or skirt 16 which extends down into the crank case as best illustrated in Fig. 1. This downward extension of the cylinder 1 is formed at diametrically opposite points with edge recesses 17 that are designed to accommodate the long stroke connecting rod or pitman 14 and the crank case end of the sleeve 5 is correspondingly recessed as at 18 for the same purpose. In order to accommodate the crank case end of the piston 12 to the limit of a desirable stroke or movement, its edge is formed with diametrically disposed recesses 12^a in which the studs or pins 7 of the sleeve 5 are received, when the piston 12 and sleeve 5 have been moved to their limits in their rearward travel.

From the foregoing description in connection with the accompanying drawing, the operation of my improved internal combustion engine will be apparent. In the operation of the engine, when the compression stroke is being made, it will be noted that the sleeve 5 and piston 12 both move in the same direction and that when the aspirating stroke is being made, the sleeve 5 will be moved downward to cover or close the recesses 17, whereby the piston will have a solid bearing surface at the recessed lower edge of the cylinder 1, the effective area of the cylinder being thereby increased to provide for the long stroke of the piston, while at the same time, the length of the cylinder is not increased. It will thus be seen that by my invention I am able to secure a comparatively long stroke engine with a comparatively short working cylinder, which is a desideratum in this art, particularly when the engine or motor is to be used in automobile or similar work.

It will of course be understood that my invention is not limited to an engine of any number of cylinders and that various changes may be made in the construction, arrangement and proportion of the parts hereinbefore described and illustrated in the accompanying drawing, without departing from the scope of the invention as defined in the appended claims. It is also to be understood that my invention is equally applicable for use in two-cycle engines and engines of the four-cycle type.

Having now fully described my invention what I claim is:—

1. An engine of the reciprocating piston type, including a working cylinder, an open ended sleeve mounted to reciprocate in said cylinder, a crank case connected to the cylinder, the cylinder being formed with an extension projecting into the crank case, a piston mounted to reciprocate in said sleeve, a drive shaft mounted in the crank case, an eccentric connection between said drive shaft and the sleeve, the drive shaft being provided with a crank, and a pitman connected to said crank and to the piston, the extension of the cylinder being formed with recesses in the path of movement of said pitman and the adjoining end of the sleeve being formed with corresponding recesses.

2. An engine of the reciprocating piston type, including a working cylinder, a crank case connected thereto, the cylinder being formed with an extension projecting into the crank case, a sleeve mounted to reciprocate in said cylinder, a piston mounted to reciprocate in the sleeve, a crank shaft journaled in the crank case and formed with laterally spaced eccentrics and a crank pin connecting the eccentrics, the sleeve being provided at its crank case end with inwardly projecting studs, connecting rods journaled on said studs and provided with straps mounted on said eccentrics, and a pitman operatively connected to the crank pin and to the piston, the extension of the cylinder and the crank case end of the sleeve being formed with corresponding openings in the path of movement of said pitman and the piston being formed with diametrically opposite edge recesses adapted to accommodate said studs.

3. An engine of the reciprocating piston type, including a working cylinder, an open ended sleeve mounted to reciprocate in said cylinder, a crank case connected to the cylinder, a piston mounted to reciprocate in said sleeve, a drive shaft mounted in the crank case, an eccentric connection between said drive shaft and the sleeve, the drive shaft being provided with a crank, and a pitman connected to said crank and to the piston, the cylinder being formed at its crank case end with recesses to provide clearances for the pitman, and the sleeve being arranged on the downward stroke of the piston to cover said recesses, for the purpose specified.

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

WILLIAM I. WHEELER.

Witnesses:

E. G. WHEELER,
O. K. BERRYMAN.