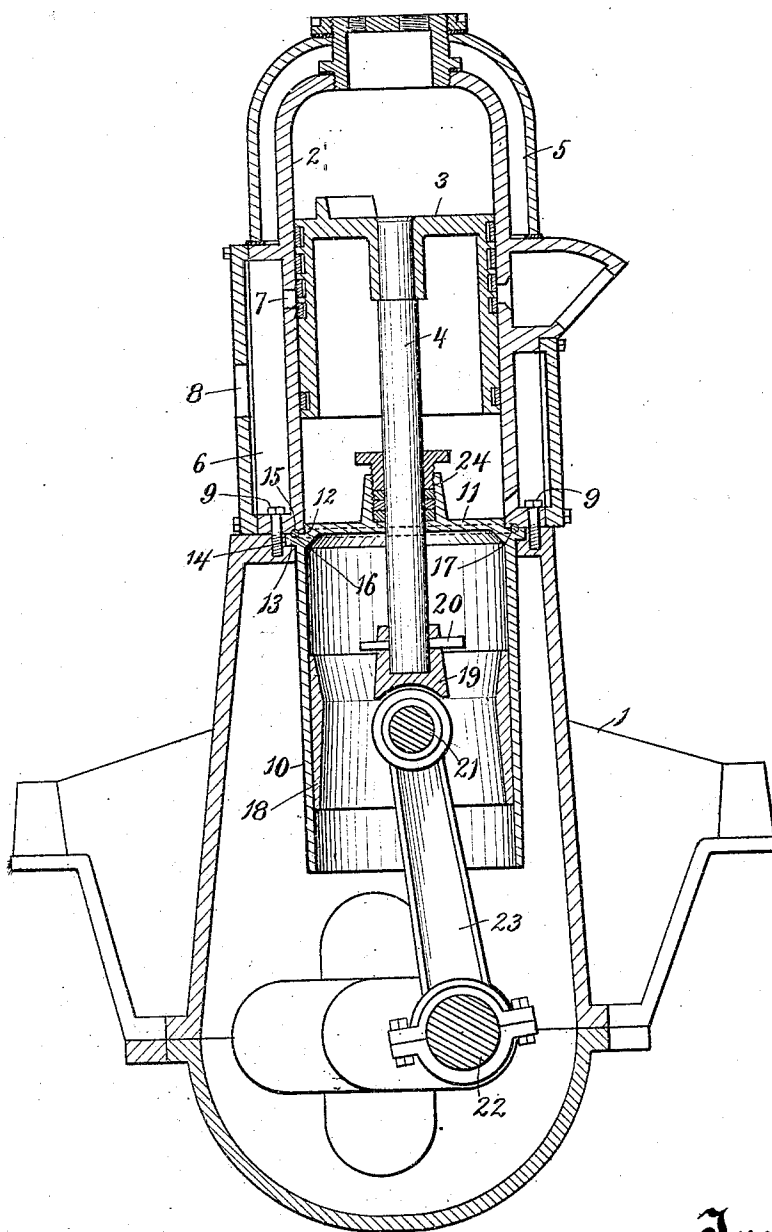


E. B. PARKHURST.
ENGINE OR MOTOR.
APPLICATION FILED JUNE 28, 1907.

Patented Oct. 5, 1909.

935,809.



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UNITED STATES PATENT OFFICE.

EDWARD B. PARKHURST, OF MOLINE, ILLINOIS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD B. PARKHURST, residing in Moline, in the county of Rock Island and State of Illinois, have invented new and useful Improvements in Engines or Motors, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in engines or motors, having particular reference to the slide and the guide or way therefor.

The invention is shown in connection with a two-cycle explosive engine in which the charge is compressed in a chamber surrounding the cylinder, instead of being compressed in the crank chamber. It is to be understood, however, that the invention is not limited to this particular form of engine or motor, as it may be used to equal advantage in connection with a steam engine having the opposite ends of the cylinder closed, and in which the compression takes place in a chamber surrounding the cylinder; or it may be used in the forms of engines or motors wherein the compression takes place in the crank chamber.

One of the important objects of the invention is to provide a construction wherein the cross-head runs in a way or guide which is clamped between the cylinder and the crank frame in such manner that said slide is concentric to the cylinder, so that the centers are all brought into exact alinement.

A further object is to provide a construction wherein the cross head is made to fit the way or guide with the same degree of accuracy that the piston fits the cylinder, thereby positively insuring against the way or guide getting out of alinement.

A further object resides in providing the way or guide with a closed end which acts as a separating partition between the cylinder and the crank frame, which is especially important where my invention is applied to a two-cycle engine in which the charge is compressed in a chamber surrounding the cylinder, instead of being compressed in a crank chamber.

With the above objects, and other incidental objects, in view, the invention consists of the devices and parts, or their equivalents, as hereinafter set forth.

The accompanying drawing illustrates a longitudinal sectional view of a two-cycle

explosive engine equipped with my improvements, the said engine being of the type herein before referred to, namely, of such construction that the compression takes place in a chamber surrounding the cylinder.

Referring to the drawing, the numeral 1 indicates a crank chamber, the wall thereof being preferably of aluminum. This portion of the engine, however, when my invention is used in connection with the particular form of explosive engine illustrated, need not necessarily be in the form of a chamber, but may, if desired, be merely in the form of an open frame work, in view of the fact that in the particular engine illustrated the compression does not take place in the crank chamber.

Surmounting the crank frame is a cylinder 2, within which reciprocates the piston 3 provided with the usual piston rod 4. The explosive end of the cylinder is surrounded by a water jacket 5, and the remaining portion of the cylinder by a compression chamber 6, an inlet port 7 connecting the cylinder with this chamber, and an air or mixture inlet port 8 being provided in the outer wall of said compression chamber. The cylinder is connected to the crank frame by means of screw bolts 9 which pass through the inner end of the compression chamber and screw into the adjacent end of the crank frame.

The improved form of cross head guide or way is an elongated member 10 extending from the end of the crank frame which is adjacent to the cylinder, and being concentric with said cylinder, and extending for a desired distance within the crank frame. It is preferably of cylindrical form, and also preferably of the same diameter as the cylinder. Where the way or guide is applied to a form of explosive engine such as illustrated in the accompanying drawing, the upper end of the guide way is closed, and forms a partition 11 between the adjacent ends of the cylinder and crank frame, so as to preclude the possibility of any of the compressed charge being forced into the crank frame.

I so construct the end of the guide or way and the end of the cylinder that a most accurate alinement or centering of the several parts is secured, and this construction may be employed whether or not the guide or way is used in connection with the form of explosive engine herein shown and described, or in connection with any other form of engine. The specific construction referred

to consists in providing the adjacent ends of the cylinder and crank frame with abutting shoulders which are so disposed and arranged that when brought together the way or guide is concentric to or accurately centered with the cylinder. In carrying out this idea, I have shown the upper end of the guide or way as provided with a shoulder 12 abutting against the inner side of the lower end of the cylinder, and also said upper end of the guide or way as provided with a projecting flange 13 which fits against a shoulder 14 formed at the corresponding end of the crank frame. This is a desirable arrangement of shouldered fitting for securing the object contemplated, but I do not desire to be understood as limiting myself specifically thereto, as any other arrangement of abutting shoulders between the cylinder and crank frame, in connection with the bolts 9, in order to obtain a concentric alinement of the parts, may be provided without departing from the spirit and scope of my invention. In order to effect a tight joint between the adjacent ends of the cylinder and guide or way, I also prefer to provide said ends with registering grooves 15 and 16, respectively, to receive a lead wire forming a packing 17.

The slide is indicated by the numeral 18, and said slide accurately fits the guide or way so as to secure a close fit throughout of the slide within the way, and thereby avoid any danger of the slide getting out of alinement. The slide is preferably in the form of a cast iron shell, and when the guide is of cylindrical form, the slide, of course, is of a corresponding shape in cross section.

The upper end of the slide is intersected by a cross head 19, to which the end of the piston rod 4 is connected by means of a pin 20. Also extending across the slide is a pin 21 which is connected to the crank shaft 22 by means of the connecting rod 23.

Where the guide or way is formed with the closed end 11, it is a convenient and desirable arrangement to form said end with a projecting socket constituting one member of a stuffing box 24.

From the foregoing description, it will be seen that the way or guide for the slide is not fastened except by the cylinder being bolted to the crank frame through the medium of the securing bolts 9, and that a tight joint between the two is secured by means of the packing 15, and that this construction may be provided whether or not the guide or way is constructed with the closed end 11.

While I prefer to construct the guide or way with a closed end, as a matter of simplicity in construction, when the invention is employed in connection with the type of engine in which the compression occurs in a chamber surrounding the cylinder, yet I do

not wish to be understood as restricting myself specifically thereto, inasmuch as in this particular type of engine the partition which shuts off communication between the cylinder and crank frame may be entirely separate from the guide or way. Or, again, where my improved form of guide or way and its reciprocating slide is employed in connection with an engine wherein the compression takes place in the crank chamber, the separating partition may be omitted altogether.

While the particular manner of clamping the way or guide between the cylinder and the crank frame is the most desirable and preferred manner of constructing, yet I do not wish to be understood, in all cases, as limiting myself thereto, inasmuch as I would consider the particular construction of the slide, and its way herein shown and described to be a novel combination and arrangement of parts, irrespective as to the manner of securing the guide or way, and also irrespective as to whether or not said guide or way is provided with a closed end. I furthermore do not wish to be understood as limiting myself to the cylindrical form of the guide or way and the slide, as herein shown and described, inasmuch as any other desirable form may be substituted, without departing from the spirit and scope of the invention. In fact, the wall of the way or guide need not necessarily be a solid wall as entirely satisfactory results may be obtained if openings or cut out portions are left in the metal.

Where the invention is employed in connection with a plurality of cylinders the adjacent guides or ways may be arranged close together, and where they are of cylindrical form registering flat contact surfaces may be provided to prevent the ways or guides from turning.

Referring again to the advantages possessed by my construction, I would call attention to the fact that in other forms of engines in which the compression takes place in a chamber surrounding the cylinder, the guide or way for the slide is formed by the wall of the crank-chamber, and communication between the cylinder and crank chamber is cut off by means of a separate partition. Under this construction it is not only necessary to aline and center the cylinder with respect to the wall of the crank chamber, but it is also necessary to accurately fit the separate partition so as to properly center the opening thereof for the piston rod. In my construction, however, wherein the guide or way is separate from the wall of the crank frame or casing, and wherein the portion is formed at one end of the guide or way, it is only necessary to secure the proper shouldered fit between the parts, as hereinbefore described and this fit necessarily at once

brings all the parts in proper alinement and center.

What I claim as my invention is:

1. In an engine or motor, the combination
5 of a cylinder, a piston therein, a crank shaft,
a frame or casing in which the crank shaft
is mounted, said frame or casing having one
end adjacent to one end of the cylinder and
secured thereto, a guide or way within the
10 crank frame or casing and extending longitudinally
thereof for a desired distance
and consisting of a tubular shell separate
from or independent of the wall of the crank
frame or casing, the upper end of said guide
15 or way extending slightly within the adjacent
end of the cylinder and bearing against
the inner face of the wall of the cylinder,
and said guide or way just below its upper
extremity provided with a projecting flange
20 fitting beneath the end of the cylinder and
against a shoulder formed at the end of the
crank frame or casing, whereby an accurate
centering and alinement of the parts are
secured, a slide within the guide or way con-
25 forming to the shape of and fitting said
guide or way, a piston rod connecting the
slide to the piston, and a connecting means
between the slide and the crank frame.

2. In an engine or motor, the combination
of a cylinder, a piston therein, a crank shaft, 30
a frame or casing in which the crank shaft
is mounted, said frame or casing having
one end adjacent to one end of the cylinder
and secured thereto, a guide or way within
the crank frame or casing and separate from 35
or independent of the wall of said crank
frame or casing, the upper end of the guide
or way extending slightly within the adjacent
end of the cylinder, and bearing against
the inner face of the wall of the cylinder, 40
and said guide or way just below its upper
extremity provided with a projecting flange
fitting beneath the end of the cylinder and
against a shoulder formed at the ends of the
crank frame or casing, whereby an accurate 45
centering and alinement of the parts are
secured, a slide within the guide or way, a
piston rod connecting the slide to the piston,
and a connecting means between the slide
and the crank shaft. 50

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

EDWARD B. PARKHURST.

Witnesses:

MINNIE T. WATT,
E. H. TINGLE.