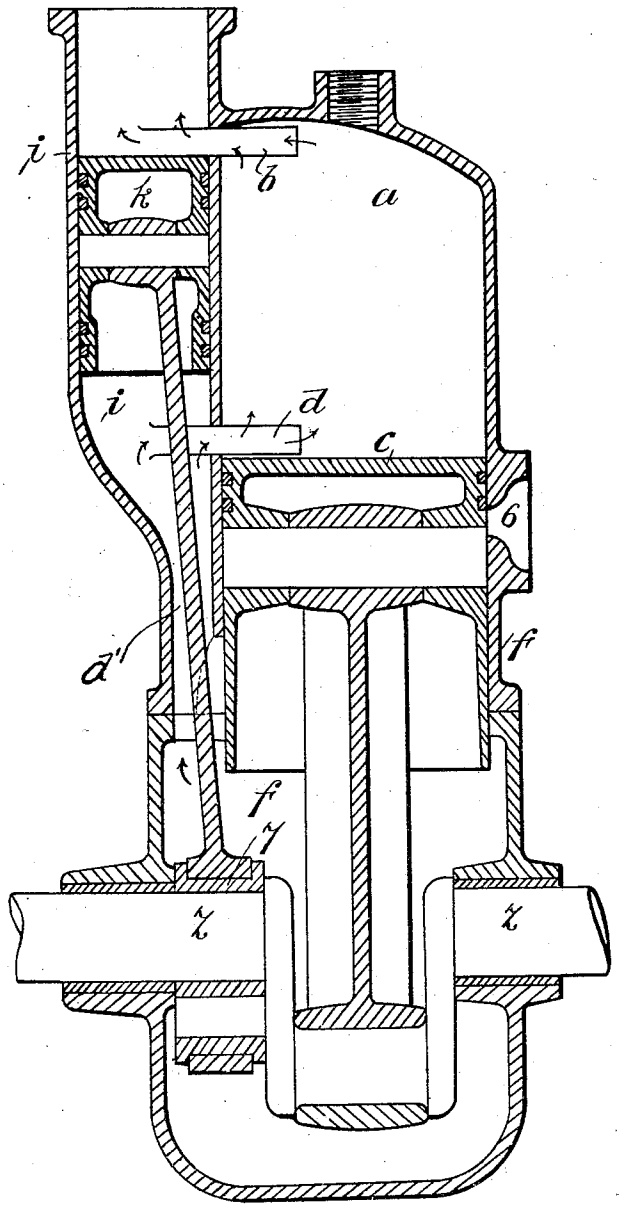
E. TILSTON.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED MAR. 14, 1917.

1,246,496. Patented Nov. 13, 1917.



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UNITED STATES PATENT OFFICE.

EDWARD TILSTON, OF LONDON, ENGLAND.

INTERNAL-COMBUSTION ENGINE.

1,246,496. Specification of Letters Patent. Patented Nov. 13, 1917.

Original application filed August 16, 1916, Serial No. 115,224. Divided and this application filed March 14, 1917. Serial No. 154,806.

To all whom it may concern:

Be it known that I, EDWARD TILSTON, a subject of the King of Great Britain, residing at 15 Grape street, London, England, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to improvements in two-stroke cycle internal combustion engines of the crank case compression type, and forms a division of my pending application, Serial No. 115,224, filed August 16, 1916.

According to the invention the admission of carbureted air from the crank case to the engine cylinder is effected by the engine piston overrunning a port suitably situated in the lower part of the cylinder in known manner, while the exhaust port at the upper end of the cylinder is controlled by a piston valve, the underside of which is in communication with the crank case so that the combined displacement of the engine cylinder and piston valve is available for forcing the carbureted air into the engine cylinder, whereby good scavenging and charging are insured. The carbureted air is preferably admitted to the crank case by a port overrun by the engine piston as it approaches the end of the compression stroke, but an automatic check valve of usual form may be adopted.

In the accompanying drawing one form of engine according to the invention is somewhat diagrammatically indicated in sectional elevation.

In this drawing *a* is the engine cylinder having an inlet port *d*, and an exhaust port *b*. The inlet port *d* is controlled by the engine piston *c* connected by a connecting rod and crank to the crank shaft *z* as usual. Carbureted air, supplied by any suitable form of carbureter, is admitted to the crank case *f*, through an air inlet port 6, controlled by the engine piston *c*, although an ordinary check-valve may be substituted for this arrangement.

The exhaust port *b* is controlled by a piston valve *k* reciprocated within a valve chest *i*, for example by an eccentric 7 on the crank shaft so that the port *b* is opened and closed at appropriate times. The chest *i*, is, by the passage *d'*, in communication with the crank case *f*, so that the combined displacement of the engine piston *c*, and piston valve *k*, is available for charging the engine cylinder through the port *d*. The valve chest and cylinder are preferably in one casting.

The operation of the engine is as follows:—

Assuming the parts to be in the positions indicated in the drawing the charge compressed in the crank chamber is being admitted through the inlet port *d*, to the engine cylinder *a*, and the burnt gases of the previous explosion are being expelled through the exhaust port *b*. This will be followed by the closing of the inlet port *d* by the engine piston *c*, and the closing of the port *b*, by the piston valve *k*, and subsequent compression of the charge in the cylinder *a* by the engine piston. As the engine piston *c*, approaches the end of this compression stroke it uncovers the inlet port 6 so that carbureted air is admitted to the crank case, and as both pistons *c* and *k* have been moving upwardly together their combined displacement is available to cause a good suction of air into the crank case. When the compressed charge in the cylinder *a* is ignited in usual manner the piston *c* descends under the effect of the explosion. Closure of the port 6 first occurs and subsequent compression of the air in the crank case. Opening of the exhaust port *b*, and of the inlet port *d*, then follows in due course, and as in the meantime the piston valve *k* has descended with the engine piston *c*, their combined displacement is available for compressing the air charge and forcing it into the engine cylinder. In this way good scavenging and charging are insured, the free and unobstructed exhaust port *b*, permitting of a free discharge of the exhaust gases, preventing the incoming charge mixing with the exhaust gases.

I claim:—

1. An internal combustion engine of the type referred to, comprising a cylinder, a crank case, a valve chest alongside said cylinder and communicating with said crank case, an engine piston reciprocating in said cylinder, a piston valve reciprocating in said valve chest, said cylinder having an exhaust port at one end controlled by said piston valve, and an inlet port at the opposite end controlled by said engine piston, and means for admitting carbureted air to said crank case, said crank case and valve chest

being connected to the inlet port of said cylinder, substantially as and for the purpose hereinbefore set forth.

2. An internal combustion engine of the type referred to, comprising a cylinder, a crank case, a valve chest alongside said cylinder and communicating with said crank case, an engine piston reciprocating in said cylinder, a piston valve reciprocating in said valve chest, said cylinder having an exhaust port at one end controlled by said piston valve, and an inlet port at the opposite end controlled by said engine piston, and a port in the cylinder for admitting air to the crank case when uncovered by the engine piston, said crank case and valve chest being connected to the inlet port of said cylinder, substantially as and for the purpose hereinbefore set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD TILSTON.

Witnesses:
R. WESTACOTT,
GEO. VAN DYNE.