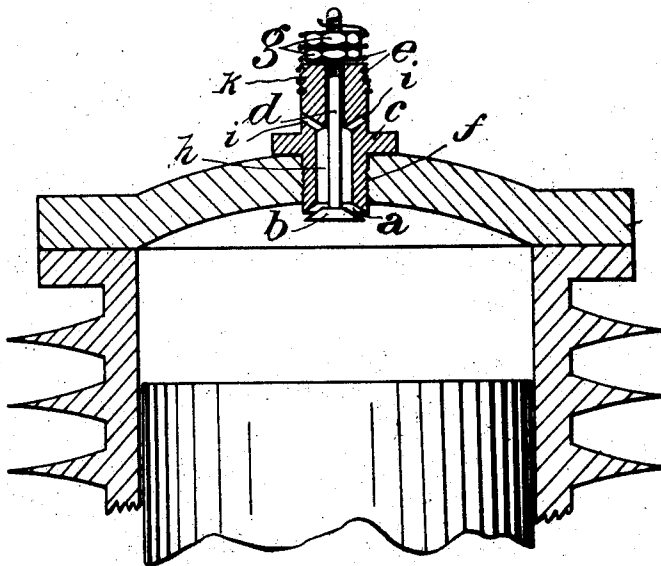


No. 854,035.

PATENTED MAY 21, 1907.

J. C. HANSEN-ELLEHAMMER.
STARTING DEVICE FOR EXPLOSION ENGINES.
APPLICATION FILED MAR. 21, 1904.



Witnesses:
Attest
W. L. Summers

Jacob Christian Hansen-Ellehammer, Inventor.

by Henry Orthof

UNITED STATES PATENT OFFICE.

JACOB CHRISTIAN HANSEN-ELLEHAMMER, OF COPENHAGEN, DENMARK.

STARTING DEVICE FOR EXPLOSION-ENGINES.

No. 854,035.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed March 21, 1904. Serial No. 199,316.

To all whom it may concern:

Be it known that I, JACOB CHRISTIAN HANSEN-ELLEHAMMER, of No. 99 Istedgade, Copenhagen, in the Kingdom of Denmark, mechanical engineer, have invented certain new and useful Improvements in Starting Devices for Explosion-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to starting devices for explosion engines and has for its object a simple construction, whereby the use of compression or cut-off cocks, or means for holding the starting valve to its seat after the engine is started, are dispensed with.

The device consists of an automatically operating valve opening toward the working cylinder and having a valve body subjected to pressure by suitable means, such as a spring or the like, to cause the valve to remain open not only when the engine is at rest and during the suction stroke, but also during the first portion of the compression stroke when the engine is to be started and when the compression but slowly increases. On the other hand, the load on the valve is not greater than that which allows the valve to close during the starting period at the latter part of the compression stroke when the compression is increasing rapidly.

When the engine is working normally the valve will be closed during the entire period of compression and consequently during the period of explosion. It is also closed during the exhaust stroke and will only open during the suction stroke.

A characteristic difference between the present valve and devices heretofore used is that the load on the valve body, that is, the tension of the spring, is adjusted independently of the explosion pressure and is only dependent upon the compression pressure, said load being adjusted to allow the closing

of the valve shortly before normal compression is attained.

The accompanying drawing illustrates the starting device in the end of a cylinder, partly in section and partly in elevation, the air, oil and exhaust valves that form no part of this invention being omitted.

The starting device comprises a plug or casing *c* having a threaded portion *f* adapted to be screwed into the cylinder of an explosion engine, preferably, but not necessarily, into its end. The inner end of the plug is formed with a conical seat *a* or the end is reamed conical. Passing through the entire length of the plug *c* is a valve stem *d* carrying on one end the valve *b* and on the other threaded end the nuts *g*. The inner end of the plug has an enlarged chamber *h* communicating with the atmosphere by ports *i* inclined to the axis of the plug. A spiral spring *e* is secured at one end to the upper threaded portion *k* of the plug; the other end of said spring rests or is attached to the upper part of the nuts *g*. By turning the nuts *g* the tension of the spring is adjusted.

The principal effect of the valve is to facilitate as well as accelerate the starting, because the compression in starting is easily overcome by hand without loss of explosive power at the instant of explosion. Another advantage in connection with the valve, is that during the suction stroke a current of cold air will be admitted into the end of the power cylinder, causing it to be cooled and also promoting the mixing of the air and fuel drawn into the cylinder.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent, is:—

The combination with the cylinder of an explosion engine, of a hollow screw-plug mounted in the cylinder having an enlarged chamber normally communicating with the cylinder at one end and provided with ports in the other end inclined to the axis of the plug connecting the chamber with the atmosphere, a threaded valve-stem passing through the plug guided in an extension formed on the latter above said chamber, a valve on the end

of the stem adapted to be seated on the lower end of the plug to close communication between the chamber and cylinder, a spring having one end connected to the plug, and nuts
5 adjustable on the stem connected to the other end of the spring whereby the tension of the latter may be adjusted to normally hold the valve off its seat.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of the subscribing witnesses.

JACOB CHRISTIAN HANSEN-ELLEHAMMER.

Witnesses:

P. HOFMAN BANG,

A. G. MICHELSON,

E. BOUTARD.