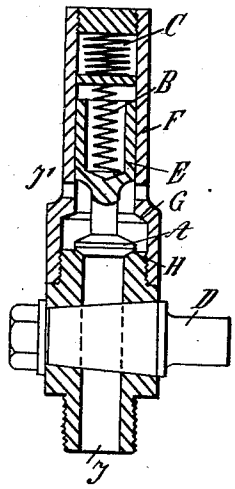
No. 714,902. Patented Dec. 2, 1902.

J. W. HINCHLEY.

MEANS FOR STARTING EXPLOSION MOTORS.

(Application filed June 20, 1901.)

(No Model.)



Witnesses
[illegible]
B. H. Sommers

John William Hinchley.
Inventor
per Attorney

UNITED STATES PATENT OFFICE.

JOHN WILLIAM HINCHLEY, OF LONDON, ENGLAND.

MEANS FOR STARTING EXPLOSION-MOTORS.

SPECIFICATION forming part of Letters Patent No. 714,902, dated December 2, 1902.

Application filed June 20, 1901. Serial No. 65,315. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM HINCHLEY, a subject of the King of Great Britain, residing at the city of London, England, have invented a new and useful Device for Starting Explosion-Motors, of which the following is a specification.

My invention relates to means for starting explosion-motors.

In explosion-motors working on the Otto cycle a small cock is generally provided, which on starting is opened to relieve the compression by allowing some of the explosive mixture to escape, so that it becomes easier to get up the necessary speed to start the motor. This arrangement has the defect that the composition of the mixture is altered by air entering the cylinder through the cock on the aspiration-stroke, so that very often explosions take place when it is open, but cease to do so when it is closed. The full force of the explosion is also lost, so that it may be necessary to make several attempts before the motor starts.

The object of this invention is to prevent this loss of the force of the explosion and at the same time to prevent air entering during the suction-stroke; and it consists in the combination of parts hereinafter particularly described, and pointed out in the claims.

In the accompanying drawing is shown my device in vertical section.

A is the seated valve, which is guided by its trunk E in the casing F. Normally it rests on the seating H. The opening I communicates with a cylinder and is put into communication with the valve-chamber by means of the plug D. During the compression-stroke of the engine spring B is compressed and the explosive mixture passes around the valve and escapes through the holes I'. When the explosion takes place, the valve A is forced on the seat G by the further compression of the spring B or of an additional spring C.

For preventing the loss of the force of the explosion and air entering during the suction-stroke, the cylinder of the motor communicates through the valve-chamber with the atmosphere, the action of the single valve contained in this valve-chamber being determined by the removal of restraint on itself or by the opening of a cock which is interposed between the cylinder and valve-chamber or between the valve-chamber and the atmosphere. The valve has two seats, either of which closes the passage between the cylinder and the atmosphere.

The valve A is a disk valve having seatings on its opposite sides. It has a small movement, and in its extreme position in one direction closes the opening of the valve-chamber to the cylinder and in the other direction of the valve-chamber to the atmosphere. A spring B maintains it with a definite pressure on the seat, which closes the opening to the cylinder, so that its pressure does not affect the aspiration-stroke of the piston. On the compression-stroke (always or when speed is low only) the valve rises slightly from its seat and reduces the compression to that determined by its spring, when, however, the pressure in the cylinder rises by the force of explosion above a certain amount, determined by the strength of spring or of an additional spring C, which only comes into action when the valve has moved sufficiently to provide a suitable opening from the cylinder, the valve closes on the second seat G and the contents of the cylinder are prevented from escaping. The strength of spring or size of valve can be so arranged that this action may take place on the compression-stroke as soon as the pistons reach a high speed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Means for starting explosion-motors, comprising a valve-casing, two seats opposite one another formed therein, ports beyond the valve-seats leading to the atmosphere, a plug-valve to open and close communication between the casing and explosion-chamber of the engine, a valve having two faces and located between the seats, a piston connected to said valve and springs acting on the piston to successively take up different pressures on the valve, for the purpose set forth.

2. Means for starting explosion-motors, comprising a valve-casing, two seats opposite one another formed therein, ports beyond the valve-seats leading to the atmosphere, a plug-valve to open and close communication between the casing and explosion-chamber of the engine, a disk valve having two faces and

movable between the seats, a hollow piston connected to the valve and guided in a part of the casing beyond the ports, a spring acting on the piston to hold said valve normally closed and a stronger spring acting on the first-mentioned one, for the purpose set forth.

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

JOHN WILLIAM HINCHLEY.

Witnesses:
H. D. JAMESON,
A. NUTTING.