No. 660,129 Patented Oct. 23, 1900.

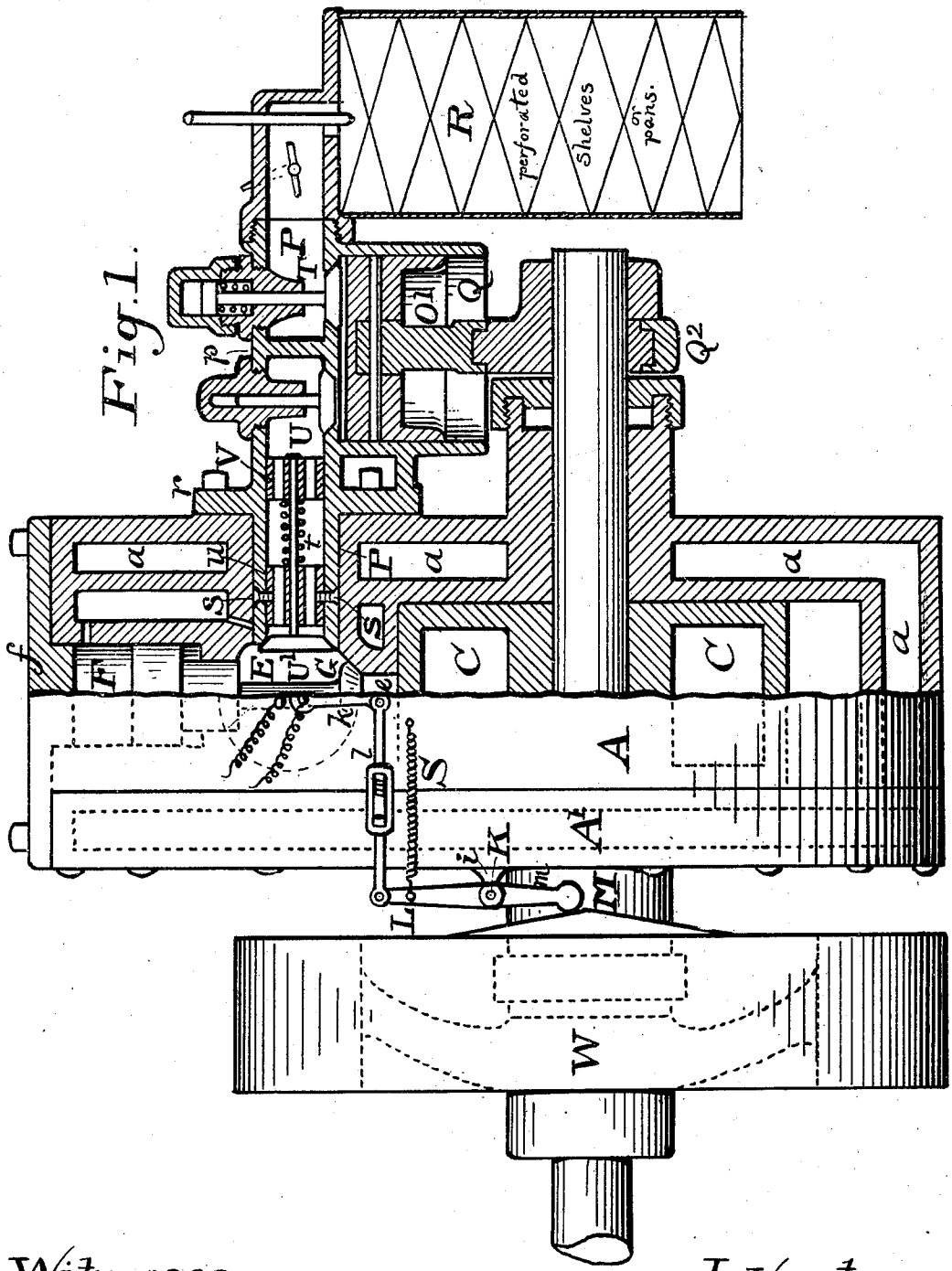
P. H. STANDISH.

ROTARY EXPLOSIVE MOTOR.

(Application filed Nov. 29, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses

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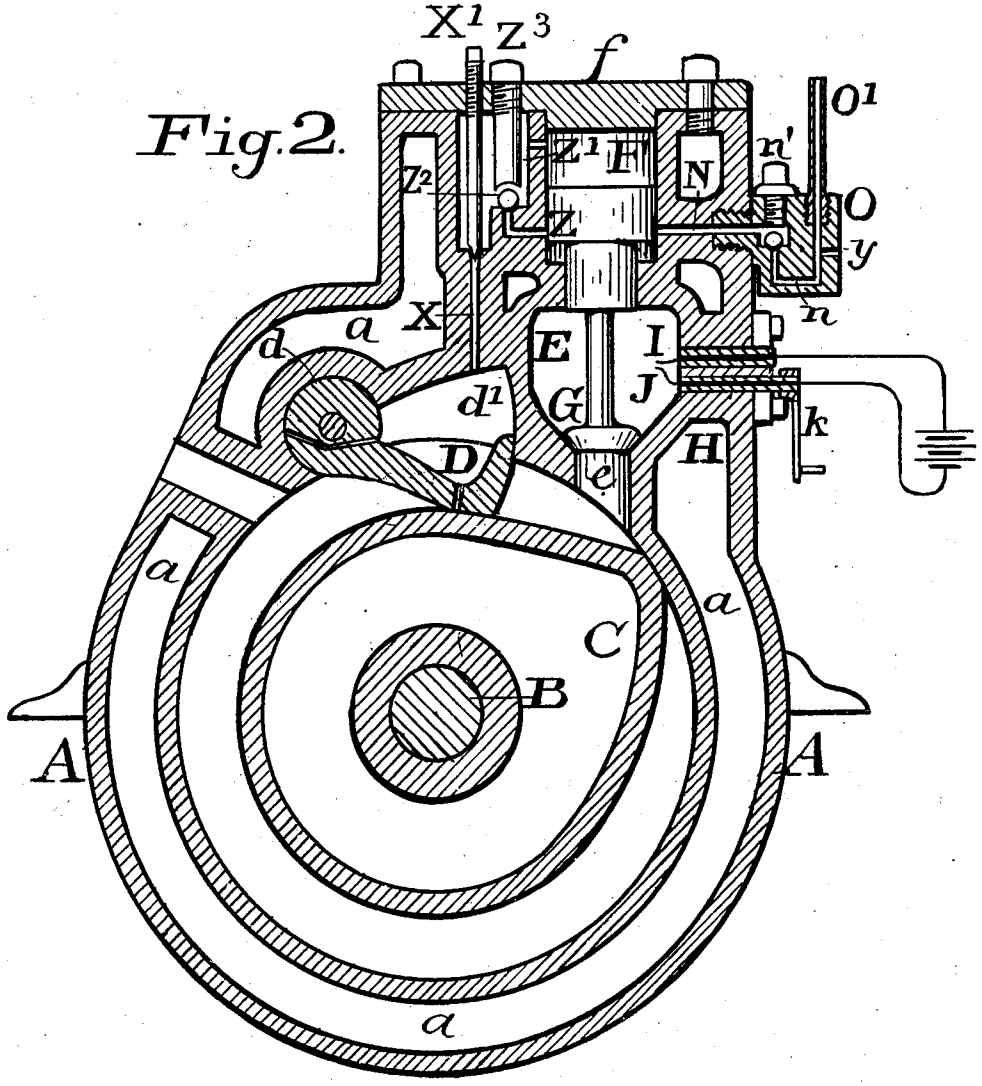
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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



Witnesses

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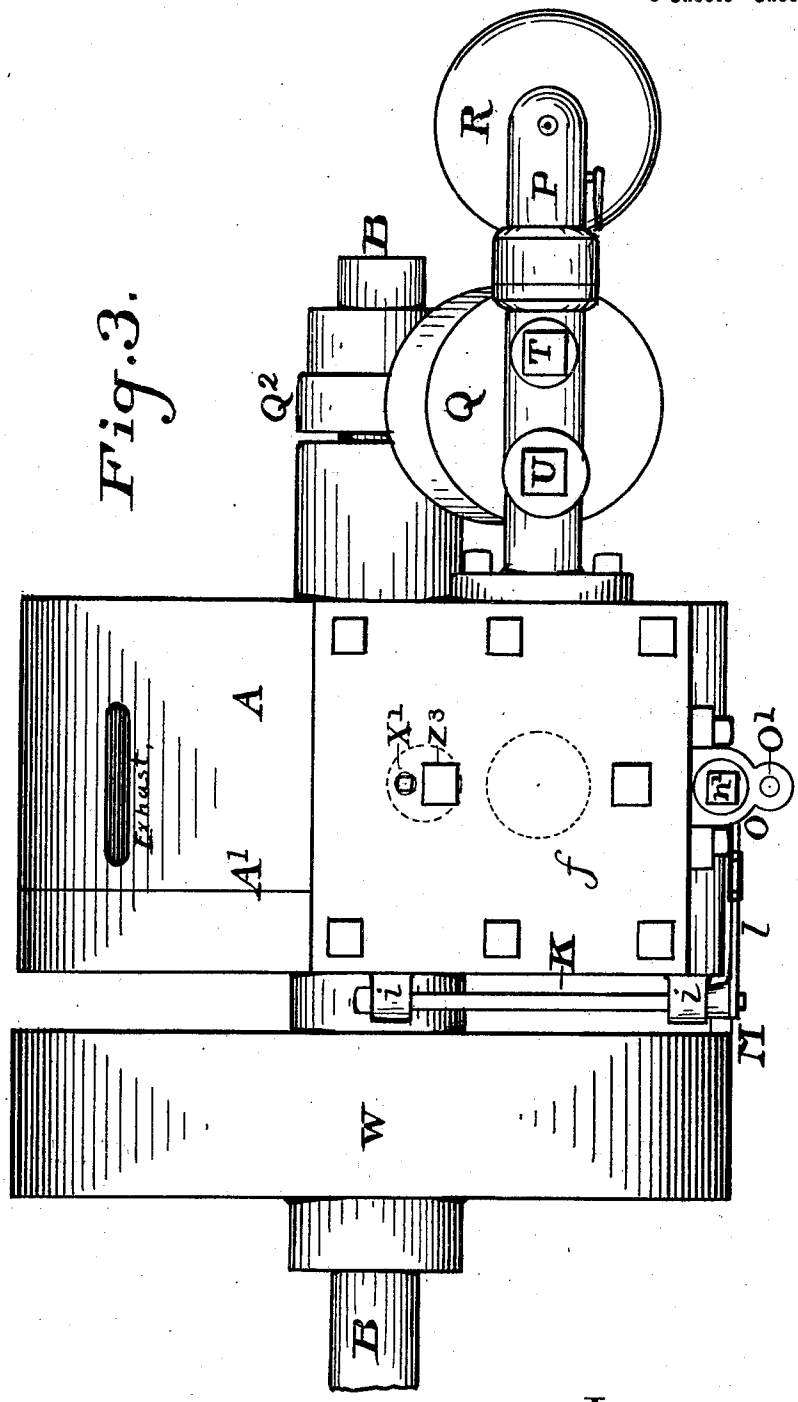
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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

PHILANDER H. STANDISH, OF CLEVELAND, OHIO.

ROTARY EXPLOSIVE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 660,129, dated October 23, 1900.

Application filed November 29, 1899. Serial No. 738,693. (No model.)

To all whom it may concern:

Be it known that I, PHILANDER H. STANDISH, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Gas-Motors, of which the following is a specification.

This invention relates to gas-motors; and it consists in the new constructions and combinations of mechanism, substantially as hereinafter described, and pointed out in the claims.

In the accompanying drawings, Sheet 1, Figure 1, is a side elevation, partly in section, of my new gas-motor. Sheet 2, Fig. 2, is a transverse vertical section on line 2 2 on Fig. 1 looking from the left. Sheet 3, Fig. 3, is a top or plan view of the gas-motor.

A represents a circular casing, through the center of which is placed the shaft B, carrying the rotary piston C. Said casing is extended in its upper part and contains the chambers for the valve and explosion purposes. The casing may be made in two or more parts, being divided as on line A′, Figs. 1 and 3. In the side and circular walls of the casing are provided the spaces *a a*, in intercommunication, for containing water, thus providing a water-jacket, surrounding the chambers and valve, through which a current of water is forced for cooling purposes. The two parts of the casing are secured together by means of bolts in the customary manner. The piston C is eccentric in form and of less diameter than the chamber in which it rotates, and has one side extended in the form of an ellipse, which impinges against the circular sides of the chamber.

D is a reciprocatory bulkhead or resisting abutment, against which the explosive force is exerted in opposition to the piston. It is segmental in form and is journaled in a bearing *d* in one side of the casing and has play in a segmental cavity *d′* in the upper side of the piston-chamber. Said abutment D rides on the rounded surface of the piston and is lifted by the elliptical extension as said piston revolves.

E is an explosion-chamber contained in the casing over the piston-chamber at one side of the central line and is connected therewith by the inlet-port *e*. Above the explosion-chamber is also provided a straight chamber F. This chamber is closed by the cap-plate *f*.

G is a vertically-reciprocatory valve the head of which moves in the upper chamber F, while its foot closes and opens the port *e*.

In the side of the casing A and connected with the explosion-chamber is provided the electric igniter, which consists of two electrodes I and J, inserted through an insulating-plug H, fixed in the opening in the side of the casing. The upper electrode I is stationary. The lower one J is loosely held and has oscillating movements imparted to it through the medium of the crank *k*, connected by rod *l* with a lever L on the end of rock-shaft K, journaled in bearings *i i* on the side of the casing A. Said rock-shaft K derives motion by means of a depending arm *m*, contacting with and pushed by projecting incline M on the fly-wheel W. S is a spring having one end fixed to the casing and the other attached to the lever L, and which acts in opposition to said incline for keeping the electrical circuit open, the incline acting to automatically close said circuit once in each revolution of the fly-wheel.

For charging the explosion-chamber with gas a pipe P is inserted in the side of the casing and secured therein by bolts through its flange *r* and leading into the side of said chamber and having its outer end connected with a carbureter R. At one side of said pipe is provided a pump-barrel Q, having its piston connected by pitman Q′ with an eccentric Q^2 on the driving-shaft B. The pipe P is divided by a cross-wall *p* over the center of said pump.

T is a suction-valve in the pipe at the side of the partition-wall *p* leading from the carbureter. U is a discharge-valve in pipe P at the opposite side of said partition-wall *p*. Through these valves the pump draws and forces the gas to the explosion-chamber.

U′ is a valve for closing the end of pipe P in the explosion-chamber, its stem being supported in a perforated sleeve *u*, secured in the pipe P by screws *s s*. To the inner end of the stem is attached a perforated head V. A spring *t* is placed on the stem between the sleeve and head, which serves to keep the valve closed. The purpose of making the

sleeve and head perforated is to provide for the passage of gas.

For lubricating the interior a passage N is made through the casing leading into the valve-chamber F. A valve-box O is fixed in the side of the casing at the outer end of said passage, having a U-shaped passage, with a ball-valve n, controlled by a screw-plug n' in the box over the valve. A pipe O' is attached to the top of box O for conveying a lubricant from an oil-cup or other suitable source into said box. An opening y is made in the side of the box O for the admission of air, which becomes carbureted as it mingles with the lubricant. At the opposite side of the chamber F is also provided a passage z, leading into a second valve-chamber z', in which is also provided a ball-valve z^2, which is also controlled by a screw-plug z^3 in the cap-plate f. From the bottom of said chamber z is made a narrow passage x, leading into the cavity d'. This passage is also controlled by a needle-pointed pin x', screwed into the top plate f.

The workings of this motor are as follows: To start it, the fly-wheel is given a revolution. This carries the piston around one revolution. At the same time the pump Q will draw and force gas into the explosion-chamber E. The igniter is also operated by the incline M on the fly-wheel. Now an explosion takes place in chamber E. This lifts valve G and opens port e, and the piston is acted upon. The explosion also forces valve U' shut. The upward movement of valve G in its chamber F serves also to admit air and the lubricant through passage N. The air in chamber F serves to cushion the valve G and avoid forcible concussion against the top of chamber F. At the same time the lubricant is injected through opening z' and can reach the interior through passage x. When the valve G returns after the explosion, it forces the air and lubricant that came in through passage N through the passage z by lifting ball z^2. This provides chambers z' and F with more air and lubricant.

Having described my invention, what I claim is—

1. The combination with the working cylinder and piston, of an explosion-chamber, a port connecting the cylinder and chamber, a valve for said port, a cushioning-chamber above the valve, a head on the valve-stem located in the cushioning-chamber and having a lower face exposed to the explosion-chamber, whereby the explosions lift the valve, substantially as described.

2. In a gas-motor, the combination with the working cylinder and piston, an explosion-chamber, a port connecting the cylinder and chamber, a valve for said port, a cushioning-chamber above the valve, a head on the valve-stem located in the cushioning-chamber and having a lower face exposed to the explosion-chamber, and an igniter connected with the explosion-chamber, and adapted to operate substantially as described.

3. In a gas-motor, in combination, a working cylinder and piston, an explosion-chamber, a port connecting the cylinder and chamber, a valve for said port, a cushioning-chamber above and for said valve, a pipe connecting the explosion-chamber with a carbureter, valves in said pipe, and a pump connected with said pipe and having its piston operatively connected with the main shaft for forcing carbureted air into the explosion-chamber, substantially as described.

4. In a gas-motor, the combination with the working cylinder and piston, an explosion-chamber, a port connecting the cylinder and chamber, a valve for said port, and a cushioning-chamber above the valve, and a head on the valve-stem located in the cushioning-chamber; of a lubricator consisting of a valve-box O attached to the side of the casing, a passage N connecting said valve-box with the cushioning-chamber F, a valve-chamber z', a passage z connecting said chamber with chamber F, and controlled by valve z^2, and a passage x connecting chamber z^2 with the cavity d', and regulated by screw-plug z^3, substantially as described.

Signed by me at Cleveland, Ohio, this 23d day of November, 1899.

PHILANDER H. STANDISH.

Witnesses:
GEO. W. TIBBITS,
CHARLES L. STOCKER.