

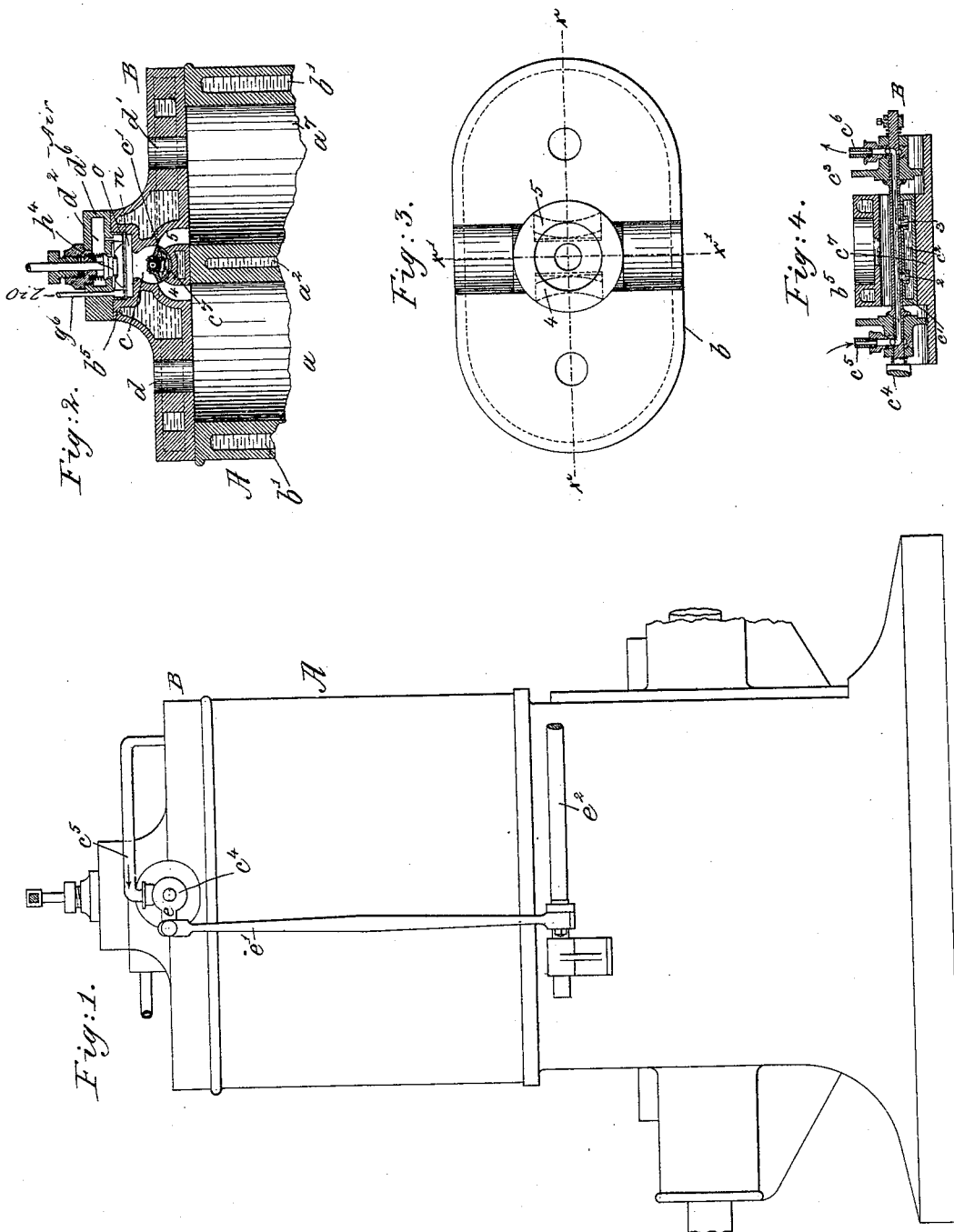
(No Model.)

J. H. CLARK.

GAS ENGINE.

No. 344,440.

Patented June 29, 1886.



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UNITED STATES PATENT OFFICE.

JOHN H. CLARK, OF BOSTON, MASSACHUSETTS.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 344,440, dated June 29, 1886.

Application filed November 9, 1885. Serial No. 182,223. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. CLARK, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Gas-Engines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of that class of engines operated by carbureted air.

In accordance with my invention a single cylinder-head is made to cover two fire-cylinders placed side by side, and preferably made in a single-jacketed casting, the said head having a separate port leading into each cylinder.

The ports referred to in the head are controlled by a valve, which opens and closes them in succession, thus enabling the piston in one cylinder to be positively driven, while the piston in the other cylinder is being returned by simply the movement of the crank-shaft with which the piston-rod of the piston of each cylinder is connected. The chamber in the cylinder-head in which the valve works is arranged just below the chamber containing the usual interceptor, the latter being sustained at its periphery in and somewhat above the bottom of its chamber, the opening or throat between the said interceptor and valve-chamber being contracted, thus enabling the metal in the shell-like cylinder-head at that point to be thickened, so that it will not be cooled as quickly as usual, such increase of thickness serving to insure a greater amount of heat in the metal at the said throat, and through which all the carbureted air has to pass from the carburetor or fire-bonnet into the fire-cylinder. The extra amount of heat thus retained by the thickened throat is sufficient to unerringly ignite the carbureted air passing from the chamber under the interceptor into the valve-chamber and in the ports leading to the fire-cylinders.

My invention consists in the combination, with two fire-cylinders and a cylinder-head provided with ports—one for each cylinder—and with a valve-chamber and an interceptor-chamber, of a fire-bonnet, an interceptor, and a valve to co-operate with the ports leading from the chamber in which the interceptor is placed to the said fire-cylinders.

My invention also consists in a cylinder-head having a chamber for the reception of an interceptor and provided with a chamber for the reception of a valve and with a port or ports leading from the said valve-chamber, combined with a valve located in the valve-chamber between the said port and the chamber in which the said interceptor is located, the throat between the latter chamber and the valve-chamber being constructed to enable the presentation of a greater amount of metal between the chamber in which the interceptor rests and the valve-chamber, to thereby retain a sufficient amount of heat to readily ignite the gas, not only when the engine is running, but also to start up the engine within a short period after it has been stopped, thus obviating the necessity of relighting the gas in usual manner.

Figure 1 is a rear side elevation of a sufficient portion of a gas-engine, taken in connection with the engine shown in my application Serial No. 176,921, to enable this invention to be understood; Fig. 2, a partial vertical section of Fig. 1 in the dotted line *x x*, Fig. 3. Fig. 3 is a top view of the cylinder-head alone, and Fig. 4 is a section of Fig. 3 in the line *x' x'*.

The shell *b* is cast to form two cylinders, *a a'*, leaving a surrounding water-space, *b'*, as in my application Serial No. 176,921; but herein each of the said cylinders so formed is intended for a fire-cylinder, instead of one for fire and the other for air, as therein described. The two fire-cylinders *a a'* are covered by means of a single cylinder-head, *B*, cored to form a chamber for the circulation of water through it in the usual manner, to keep the said head sufficiently cool to operate properly. The cylinder-head, at its upper side near its center, has a chamber, *n*, in which is placed an interceptor, *o*, which is supported therein somewhat above the bottom of the said chamber, as shown in Fig. 2. The interceptor *o* is located at the lower end of the fire-bonnet *d'*, it having a chamber, *d''*, for the passage of air, and a pipe, *g'*, for the introduction of oil, the air-passage being shown as controlled by a valve, *h'*. The bonnet, interceptor, and valve are common to my application referred to. The bonnet rests upon the seat *b''* of the head *B*. The head *B* will in practice have, as usual, an ignition-opening. The cylinder-head be-

low the chamber *n* has a chamber, *c*, in which is placed a valve, *c'*, herein shown as an oscillating valve, it being chambered, as at *c''*, (see Fig. 4,) for the reception of water, the said valve being carried by a spindle, *c'*, a part of which is made hollow and has two mouths, 2 3, for the circulation of water into and from the said chamber *c''*, as designated by the arrows, the pipes *c''* *c''* controlling the water entering and leaving the said hollow spindle. 10 The valve *c'* rests, as herein shown, upon a concaved seat, *c''*, and the valve-stem receives its motion from an arm, *e*, and link *e'*, connected to a rock-shaft, *e''*. The cylinder is 15 provided with a port, 4, leading into the cylinder *a*, and a port, 5, leading into the cylinder *a'*, the valve *c'* controlling both the said ports, and by its movement uncovering first one and then the other port for the passage 20 of the gas into the fire-cylinders *a* *a'* in succession. The cylinder-head has two openings, *d* *d'*, which in practice are for the exhaust, the head being provided at each opening with a suitable exhaust-valve, preferably such as 25 shown in my application Serial No. 176,921. The cylinder-head at the bottom of the chamber *n*, before described, and between it and the valve-chamber *c*, is provided with a contracted throat, or the metal of the cylinder-head is made to partially close the space be- 30 tween the chambers *n* and *c*, the object being to provide at that point such a thickness or amount of metal as will in the ordinary operation of the engine retain a sufficient amount 35 of heat, notwithstanding the presence of water in the cylinder-head, as to unerringly ignite quickly the gas formed in or occupying the space between the interceptor and the valve,

the heat so retained by the metal at the contracted throat having been found in practice 40 sufficient to ignite the said gas even after the engine has been stopped for a short time, which is a matter of very considerable convenience.

The employment of the two chambers with 45 the contracted throat between a valve in the valve-chamber may be advantageously practiced with single-acting engines, especially in facilitating relighting automatically.

I claim—

1. The two fire-cylinders and the bonnet 50 and interceptor, and a valve to control the passage of gas into the said fire-cylinders, combined with a cylinder-head having a chamber for the interceptor, a chamber for the said 55 valve, and ports leading to each of the said cylinders, substantially as described.

2. The cylinder-head having a valve-chamber, combined with an interceptor in a chamber in communication with the said valve- 60 chamber, the throat leading into the valve-chamber being contracted, in order to partially close, as described, the chamber containing the interceptor, whereby a quantity of metal is provided between the interceptor- 55 chamber and the valve-chamber to retain sufficient heat to insure the ignition of the gas, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two sub- 70 scribing witnesses.

JOHN H. CLARK.

Witnesses:

CHARLES A. SNOW,
J. H. CHURCHILL.