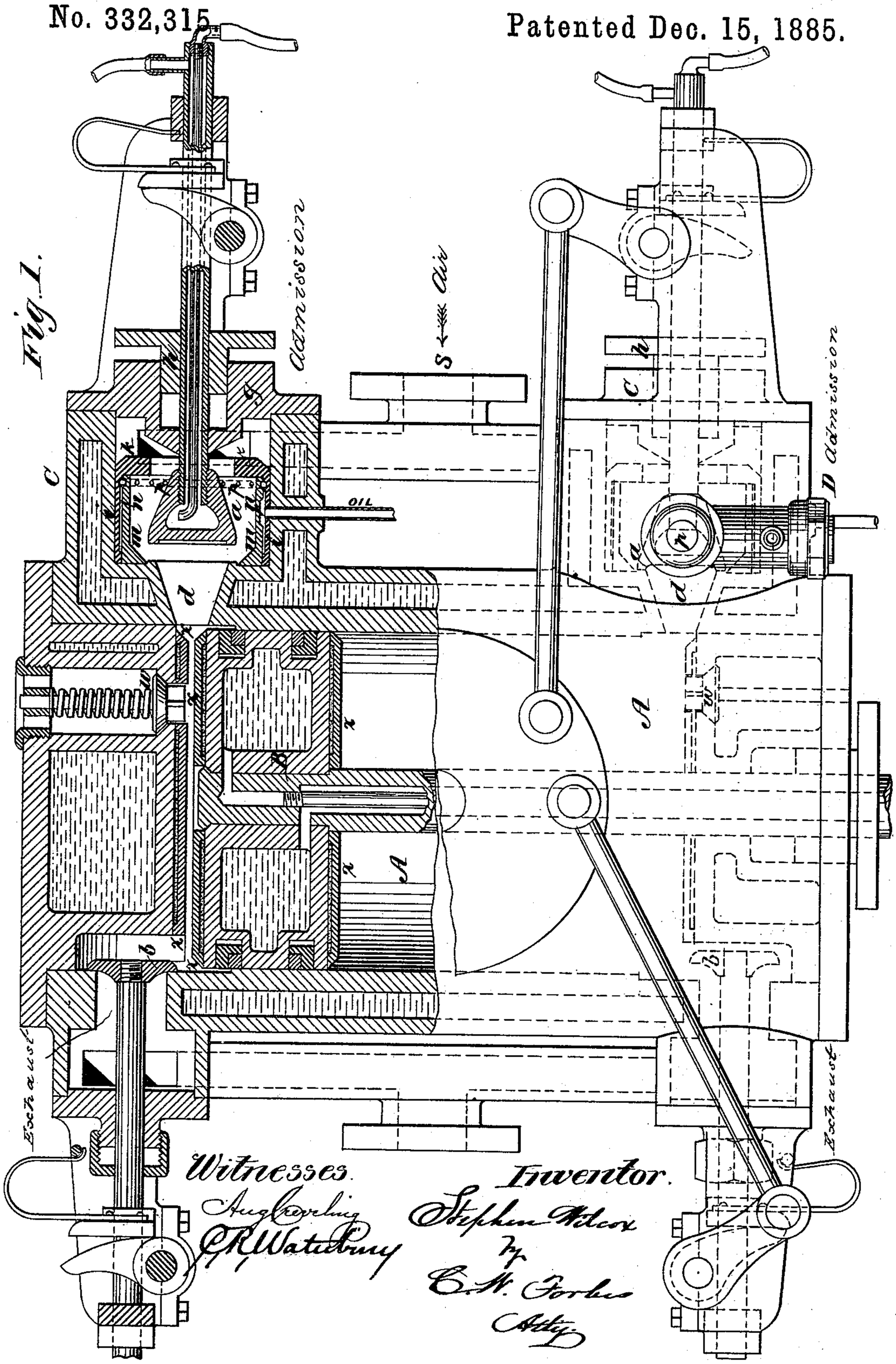
(No Model.)

2 Sheets—Sheet 1.

S. WILCOX.

GAS ENGINE.

No. 332,315. Patented Dec. 15, 1885.



(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

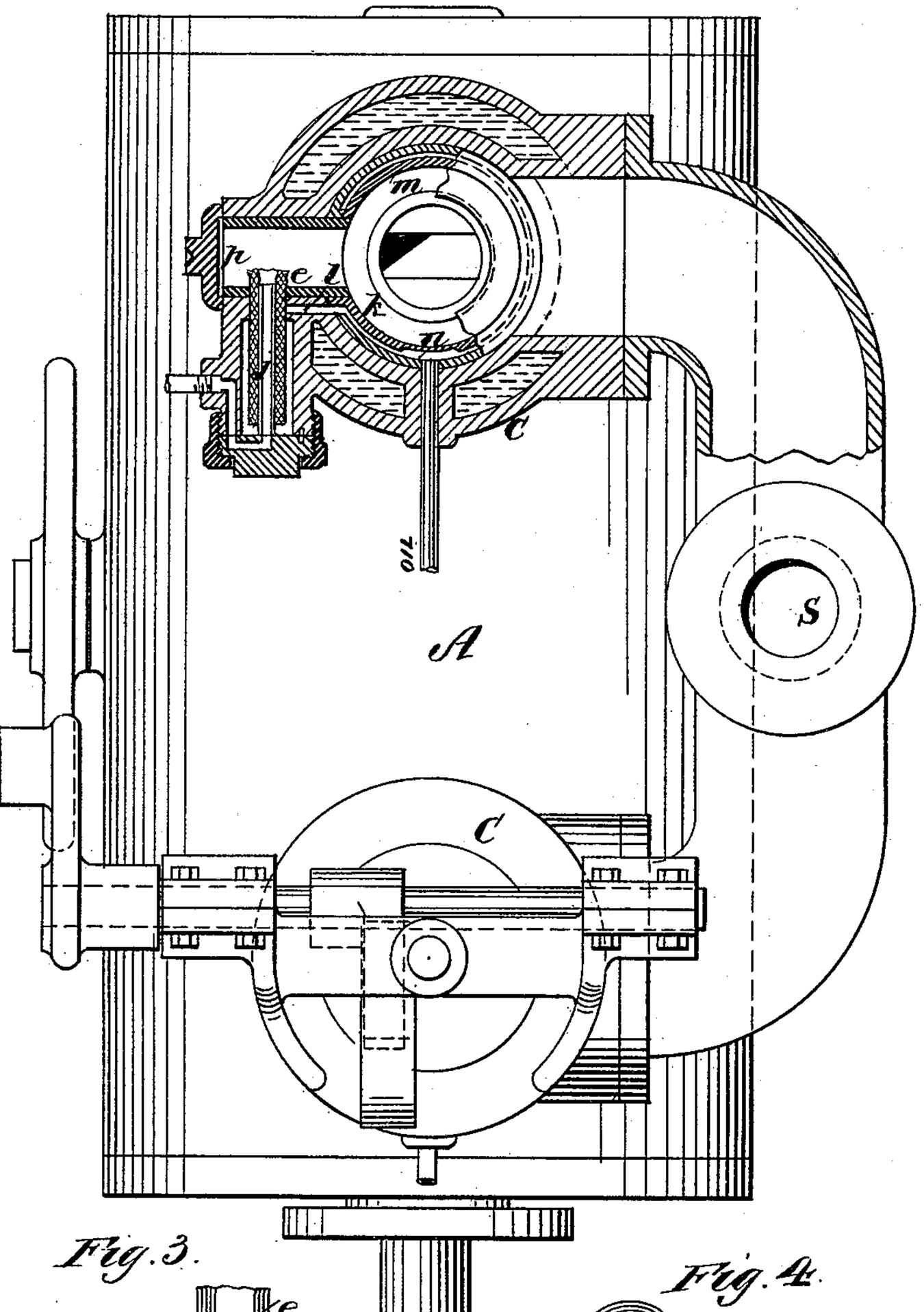


Fig. 3.

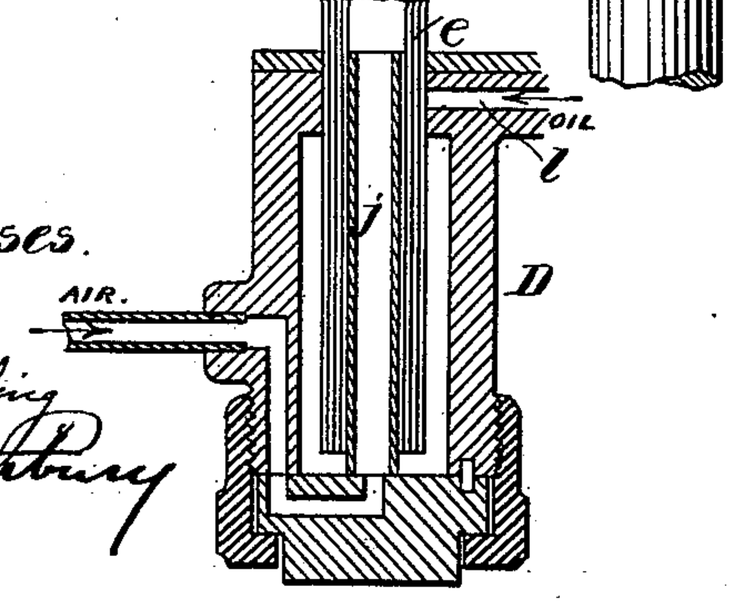
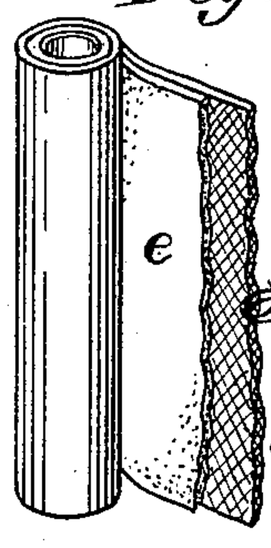


Fig. 4.



Witnesses.

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F. P. Wattbury

Inventor:

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UNITED STATES PATENT OFFICE.

STEPHEN WILCOX, OF BROOKLYN, NEW YORK.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 332,315, dated December 15, 1885.

Application filed September 17, 1885. Serial No. 177,357. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN WILCOX, of Brooklyn, in the county of Kings and State of New York, have made certain new and useful Improvements in Gas-Engines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which—

Figure 1 represents an elevation, partly in section; Fig. 2, a similar transverse view of the cylinder and connected operative parts of a gas-engine in which my improvements are embodied. Fig. 3 is a sectional view of the igniting device; and Fig. 4, a view of the igniting-wick detached and partly separated to show its structure.

This invention consists of an improved organization, construction, and relative arrangement of the parts, to which I will presently refer in detail, setting forth the advantages, and pointing out the novel characteristics of the same in the appended claims.

In the drawings, A is the cylinder, B the working-piston, *a a* the induction-valves, and *b b* the exhaust-valves. In the present instance these valves are represented as puppet-valves operated through lifting-toes, a rock-shaft, and connecting-rods, in the ordinary way.

C C are two separate combustion-chambers, located at the opposite ends of the cylinder over its respective induction-ports *d d*, and within such combustion-chambers the induction-valves *a a* are placed and operated, the valve-rods passing through the bonnet *g*, in which a stuffing-box, *h*, is provided. These combustion-chambers are duplicates, and it will only be necessary to refer to the details of one for the purpose of this application.

i is a removable shell, provided with an inwardly-projecting flange, *k*, and a lining, *m*, and between the lining and shell an oil-passage, *n*, is made, communicating with the oil-supply pipe and with the furnace through the perforations *p*, as shown.

The air-supply connection is shown at *s*, with branch pipes, Fig. 2, leading to the respective chambers C. The air enters the furnace through the opening within the annular flange *k*, the latter being more particularly designed for the protection of the bonnet *g* from the radiated heat of the furnace.

The lighter D (shown enlarged and detached in Fig. 3) is composed of a candle or annular wick, *e*, placed upon a central tube, *j*, forming a passage for the air that supports the flame, and is saturated with oil through the passage *l*. The wick *e* is made up of one or more separate layers of mineral and vegetable fiber, as shown in Fig. 4. The lighter D is located adjacent to and communicates with the furnace of the combustion-chamber, and is provided with an igniting-port, *r*. Safety-valves W W are placed at the opposite ends of the cylinder and seated upon the inner walls of the cylinder-head. This arrangement avoids lost space in the cylinder and provides exterior space for containing the valve-fixtures.

x x are coverings or protecting-plates, generally made of cast-iron and applied to the surfaces exposed to the heated gas. These plates are recessed on their inner faces, or recesses are made on the adjacent surfaces and filled with a non-conducting material, as indicated in the drawings.

The advantages attending the novel features hereinafter claimed may be summarized as follows:

First. The separate combustion-chambers contain but a fraction of the volume of the combustible, and the division admits of such a reduction in size as to effect a comparative reduction in loss of heat.

Second. In feeding the oil through a passage made between the furnace-lining and its shell, the temperature of the lining is in a degree reduced and the oil evaporated before reaching the furnace.

Third. In providing an inwardly-projecting flange above the furnace, as shown, the bonnet and stuffing-box are protected from the radiated heat of the furnace, also the entering air is materially heated thereby.

Fourth. The location of the safety-valve avoids lost space in the cylinder, and also provides room for the valve-fixtures that would otherwise project beyond the cylinder-head.

Fifth. The metallic coverings having inner recesses for holding the non-conducting material prevent the latter from getting into the cylinder.

Having thus referred to such parts to which my improvements are applied, so that others may understand the same, I do not deem it

necessary to include such other features shown that are common to this class of engines, nor to herein repeat their well-known method of operation.

Therefore, what I claim is—

1. A double-acting gas-engine provided with separate combustion-chambers, communicating, respectively, with the opposite sides of the cylinder-piston through independent induction-valves actuated by the engine mechanism.

2. In a gas-engine, a combustion-chamber provided with a suitable lining, and an oil-passage between said lining and the adjacent wall or shell.

3. In a gas-engine, a combustion-chamber constructed with an inwardly-projecting flange or annular ring arranged above the point of combustion and intermediate of the same and the entering air, for the purposes set forth.

4. A gas-engine having its interior surfaces exposed to the action of the heated gas covered with metallic plates, said plates or adjacent parts having a recessed inner surface filled with a non-conducting material.

STEPHEN WILCOX.

Witnesses:
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