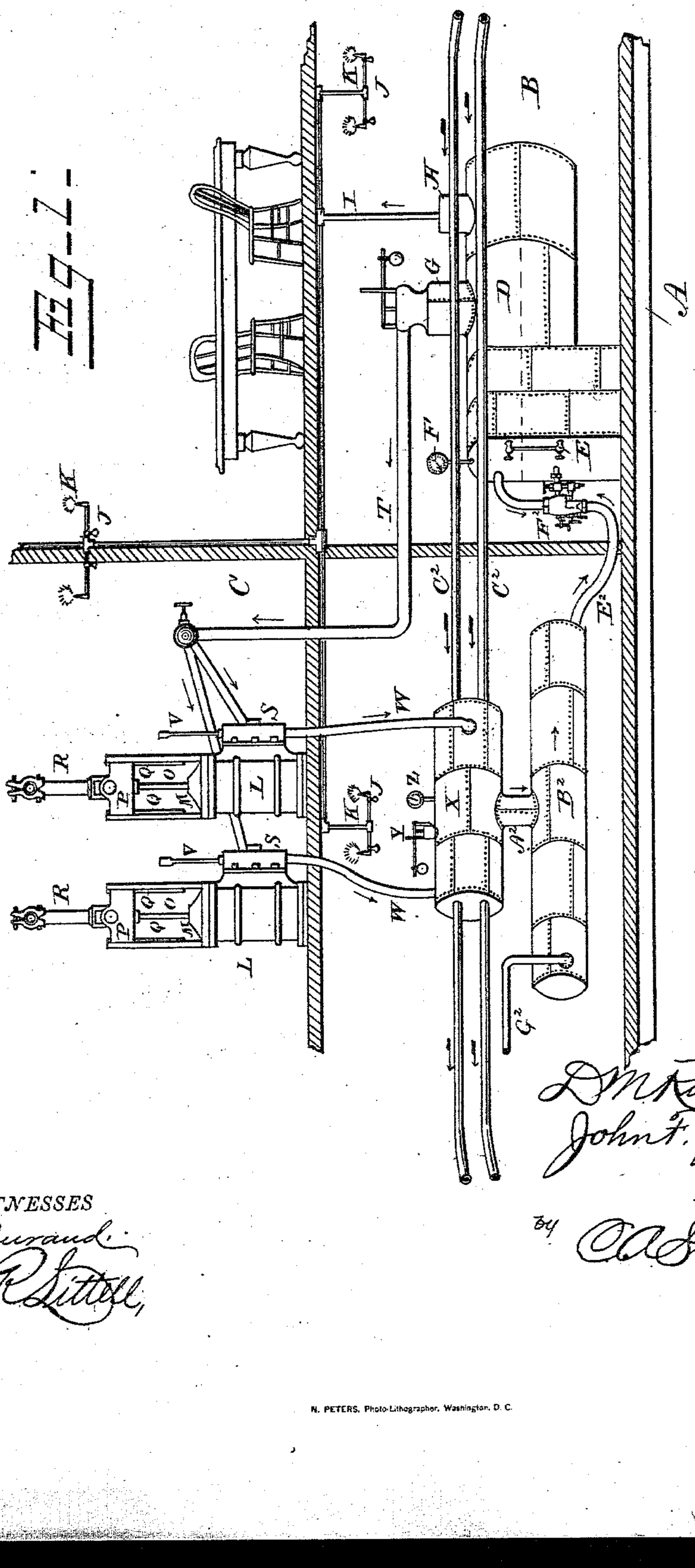
(No Model.) 3 Sheets—Sheet 1.

J. F. JACKSON & D. M. KIRKPATRICK.

GAS ENGINE.

No. 283,398. Patented Aug. 21, 1883.



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(No Model.) 3 Sheets—Sheet 2.

J. F. JACKSON & D. M. KIRKPATRICK.

GAS ENGINE.

No. 283,398. Patented Aug. 21, 1883.

Fig. 2.

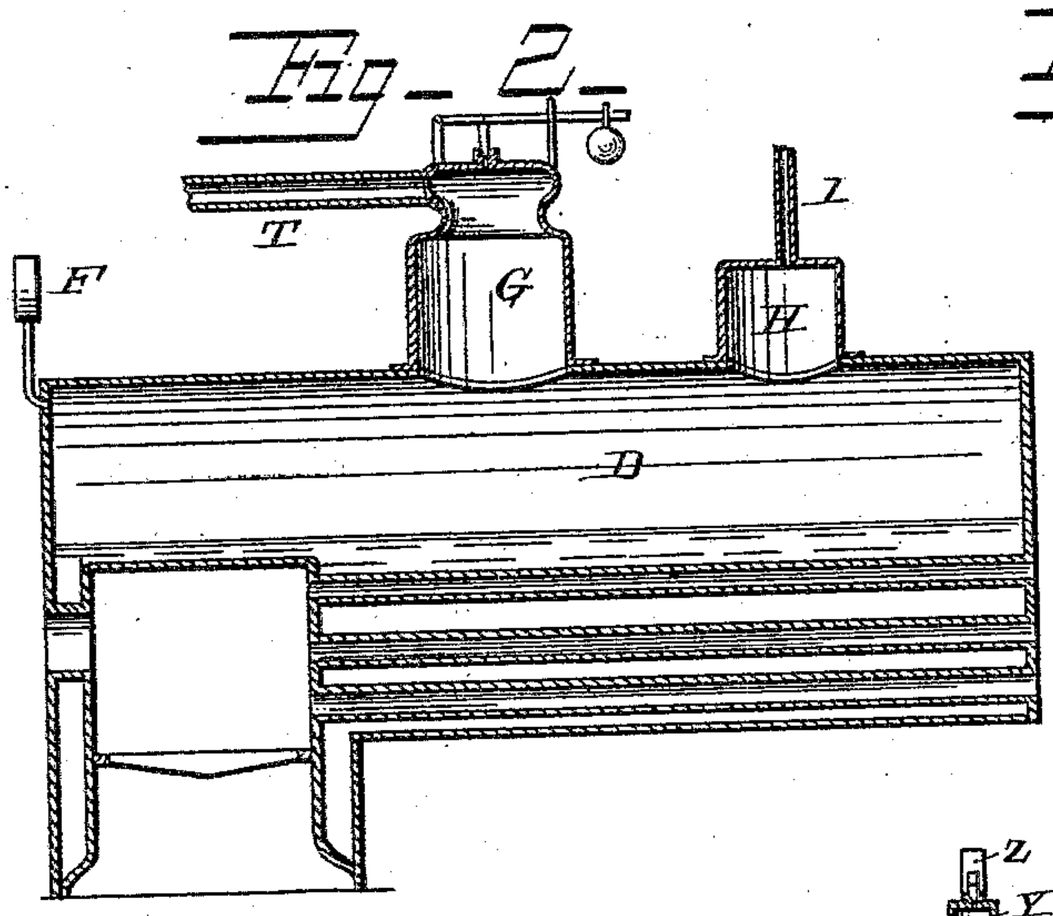


Fig. 3.

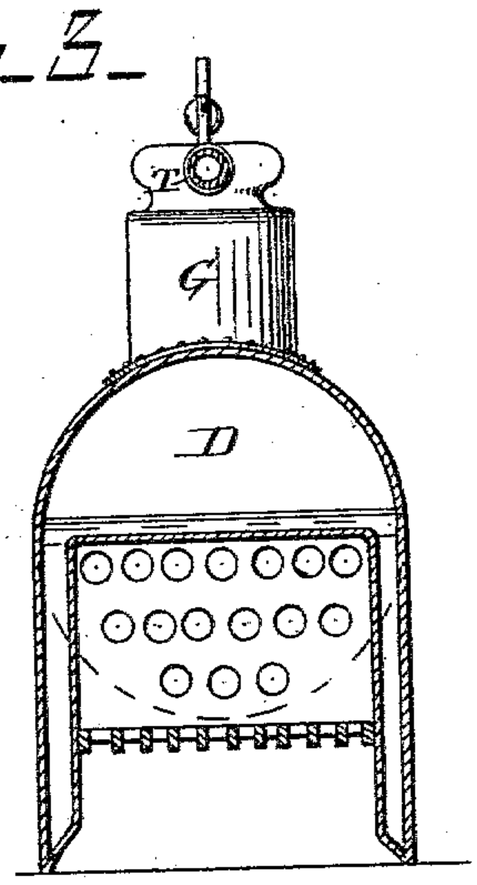


Fig. 4.

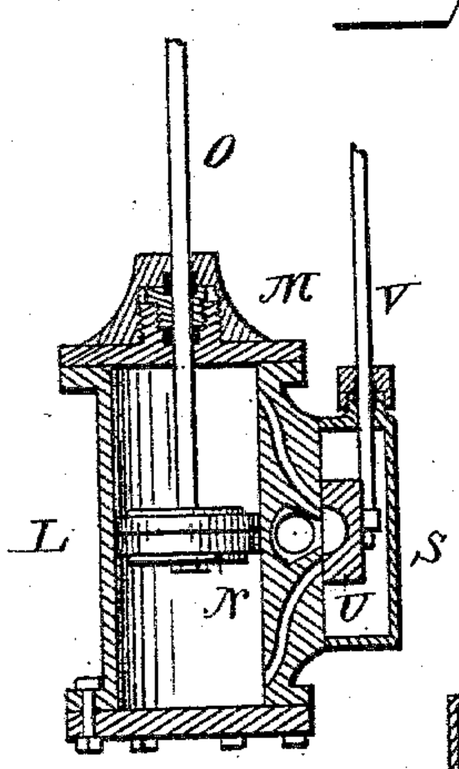


Fig. 5.

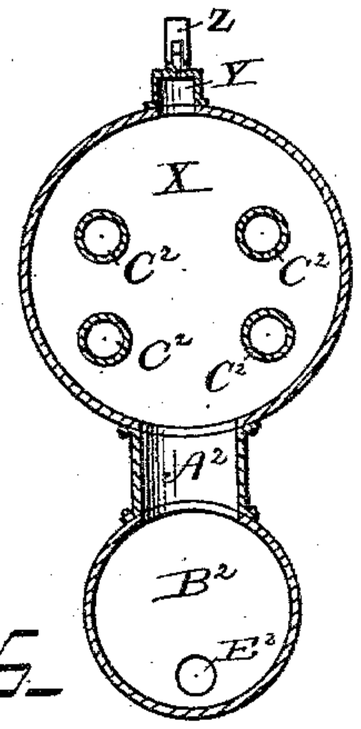
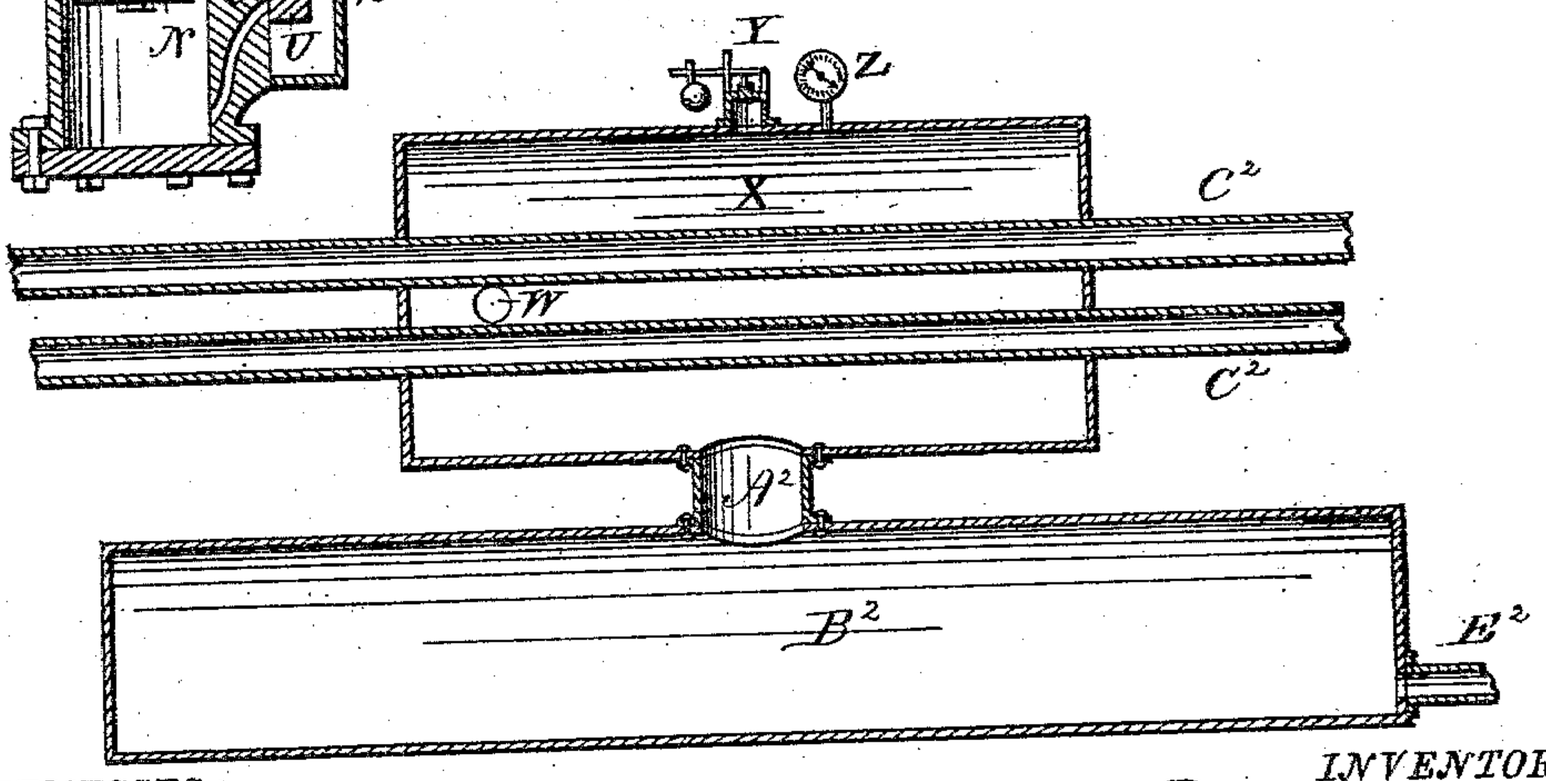


Fig. 6.



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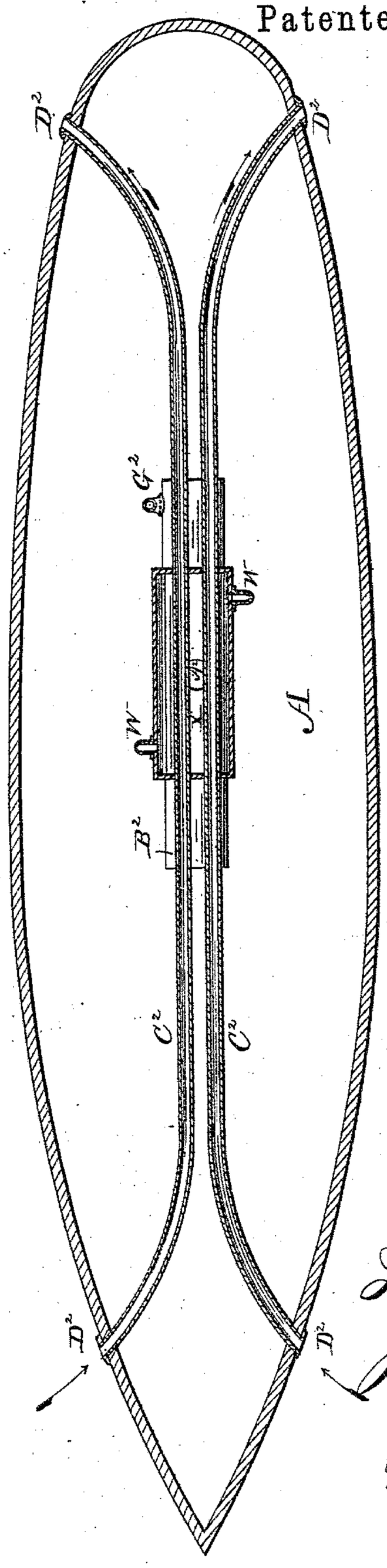
(No Model.) 3 Sheets—Sheet 3.

J. F. JACKSON & D. M. KIRKPATRICK.

GAS ENGINE.

No. 283,398. Patented Aug. 21, 1883.

Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN FREDRICK JACKSON AND DAVID MARION KIRKPATRICK, OF KANSAS CITY, MISSOURI.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 283,398, dated August 21, 1883.

Application filed December 28, 1882. (No model.)

To all whom it may concern:

Be it known that we, JOHN F. JACKSON and DAVID M. KIRKPATRICK, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Gas-Engine, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved engine for marine propulsion and for other purposes; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claim.

In the drawings hereto annexed, Figure 1 is a longitudinal vertical sectional view of part of the hull of a vessel, showing in elevation the several parts constituting our improved engine complete. Fig. 2 is a longitudinal vertical sectional view of the boiler and furnace. Fig. 3 is a vertical transverse sectional view of the same. Fig. 4 is a vertical sectional view of one of the cylinders and valve-chests. Fig. 5 is a longitudinal vertical sectional view of the condenser and reserve-tank. Fig. 6 is a vertical transverse sectional view of the same, and Fig. 7 is a horizontal sectional view taken through the condensing-tank and parts of the hull adjoining.

The same letters refer to the same parts in all the figures.

This invention relates to gas-engines; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claim.

In the drawings, A represents part of the hull of a vessel equipped with our improved engine. B may represent the boiler-room, and C the engine-room; but we would have it understood that the parts may be located differently and in any suitable manner.

The boiler, which may be an ordinary tubular boiler, is denoted by letter D. It has the gage-glass E, pressure-gage F, and domes G H, from the former of which vapor is taken for the supply of the engine, while from the latter the vapor may be conducted, through a pipe or pipes, I, to various parts of the vessel, to be used for illuminating purposes, fixtures being provided, as shown at J, in every place desired, said fixtures being equipped with suitably-constructed vapor-burners K. This feature of furnishing an illuminating medium as brilliant as gas, and at much less expense, is an important part of our invention, involving, as it does, no extra outlay beyond the first cost of the engine.

L L represent the cylinders, which, like the boiler, may be of any suitable construction or pattern. We propose, however, to provide the said cylinders with double or extra caps M, in order to secure tight joints, and to guard against the loss of power resulting from overtight packing.

N N are the pistons; O O, the piston-rods; P P, the cross-heads; Q Q, the guides for the latter, and R R the pitmen or connecting-rods, which serve to communicate the motion of the stroke from the piston-rods to the crank of the main shaft, which latter, however, is not shown in the drawings, and which may be constructed and arranged in any suitable and convenient well-known manner.

S S represent the valve-chests, to which the vapor is conducted from the boiler-dome G through a pipe, T. The valves U U may be operated by any suitable mechanism connecting their stems V V with an eccentric upon the main shaft. This mechanism, however, is not shown in the drawings, and it forms no part of the present invention. The valve-chests are connected with the cylinders by suitable passages, providing, in the usual manner, for the admission and exhaust of the vapors.

W W are the exhaust-pipes, which connect the steam-chests with a condensing-tank, X, located in the hold of the vessel, and provided with an air-valve, Y, and vacuum-gage Z. The tank X is located above, and connected by a neck, A^2, with another tank, B^2, which we call the "reserve-tank."

C^2 C^2 are pipes extending longitudinally through the tank X, and extending through the sides of the hull below the water-line, as shown at D^2. It will be thus understood that when the vessel is under way, and also, to some extent, when it is stationary, currents of water are constantly passing through the pipes C^2 C^2, thereby cooling the interior of the condensing-tank and causing the vapors conducted into the latter to condense, when they will pass through the neck A^2 into the lower reserve-

tank. The latter is connected by a pipe, E^2, with the boiler. Pipe E^2 is equipped with a suitably-constructed injector, F^2, by means of which the condensed liquid may be forced from the reserve-tank into the boiler.

Some suitable provision may be made by which the vapors may be utilized in the furnace for generating the heat necessary for vaporizing the contents of the boiler. To compensate for the liquid thus utilized for heating, as well as for illuminating purposes, additional liquid may, when necessary, be introduced into the reserve-tank B^2 through a filling-tube, G^2, with which the latter is provided.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of our invention will be readily understood. By the substitution of the vapors of light volatile oils for steam as a motive power the first and principal advantage is gained. Such oils are vaporized at a much less degree of heat than water, and consequently a great saving of fuel is effected. There being no sediment, the boiler will be always clean and free from incrustation. Owing to the lubricating qualities of the vapors, the engine will bear tight packing, and will always run smoothly and without oiling, except in places to which the vapors have no access.

By the construction and arrangement of the condenser, as described, waste of the vapor-generating liquid is totally avoided, and it will require replenishing only to compensate for such portions of the same as may be used for heating and illuminating purposes, as has been hereinbefore described. In large vessels especially, which are now generally fitted with apparatus for manufacturing gas, the expense of such machinery is, by this invention, avoided, inasmuch as a brilliant illuminating medium equal to gas, and much cheaper, is furnished.

The condensing mechanism is simple, and is constantly in operation, absolutely without expense.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States—

The combination and arrangement, substantially as described, of the boiler, the feed-pipe, the cylinders and valve-chests, the exhaust-pipe, the condensing-tank having pipes extending longitudinally through the same and through the sides of the hull, the reserve-tank located below and connected with the condensing-tank, and the injector-pipe connecting the said reserve-tank with the boiler, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

JOHN FREDRICK JACKSON.
DAVID MARION KIRKPATRICK.

Witnesses:
ROBERT B. MIDDLEBROOK,
WILLIAM H. BROWN.