

(No Model.)

3 Sheets—Sheet 1.

C. W. CLAYBOURNE & M. MOORE.

MECHANISM FOR BURNING OIL.

No. 572,866.

Patented Dec. 8, 1896.

Fig. 1.

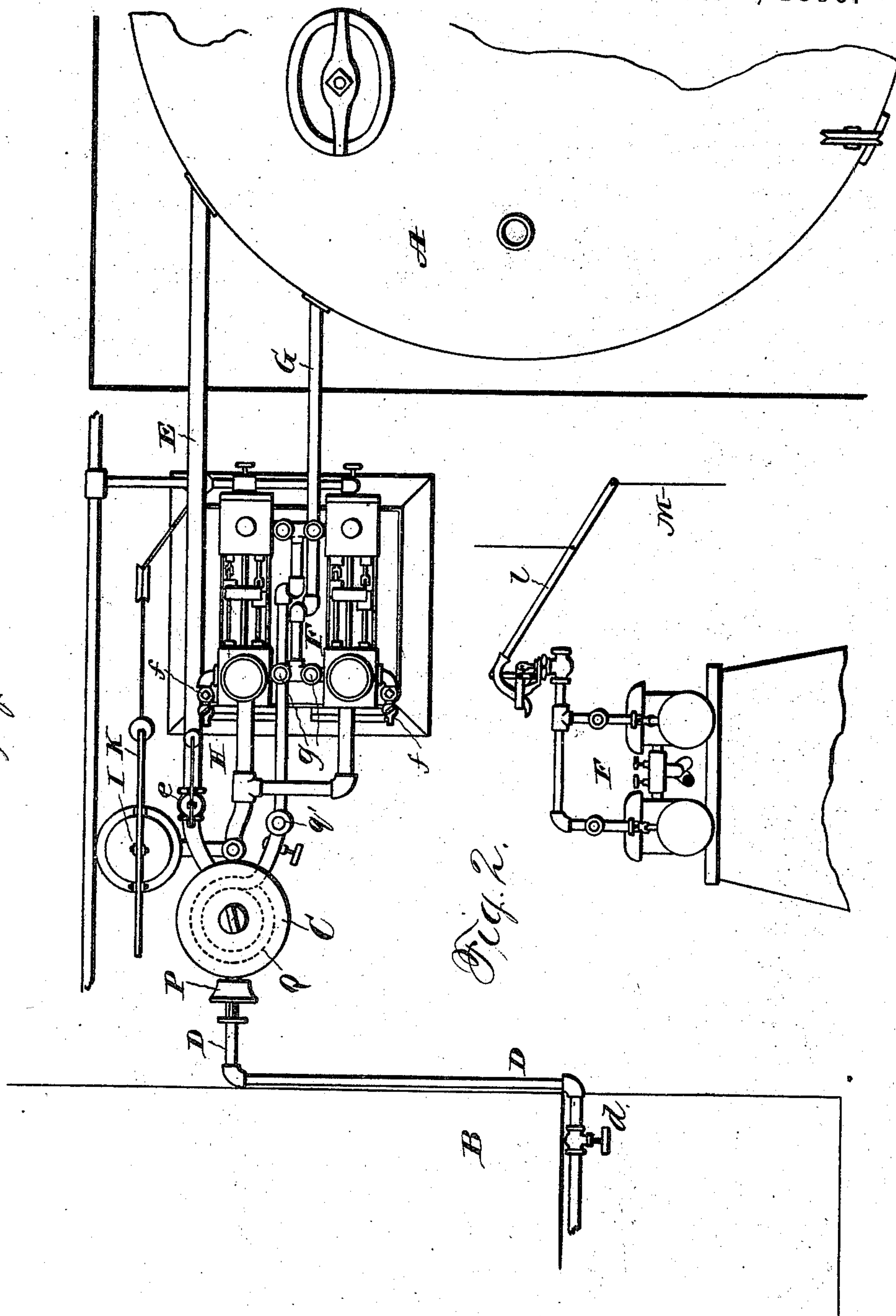


Fig. 2.

WITNESSES

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(No Model.)

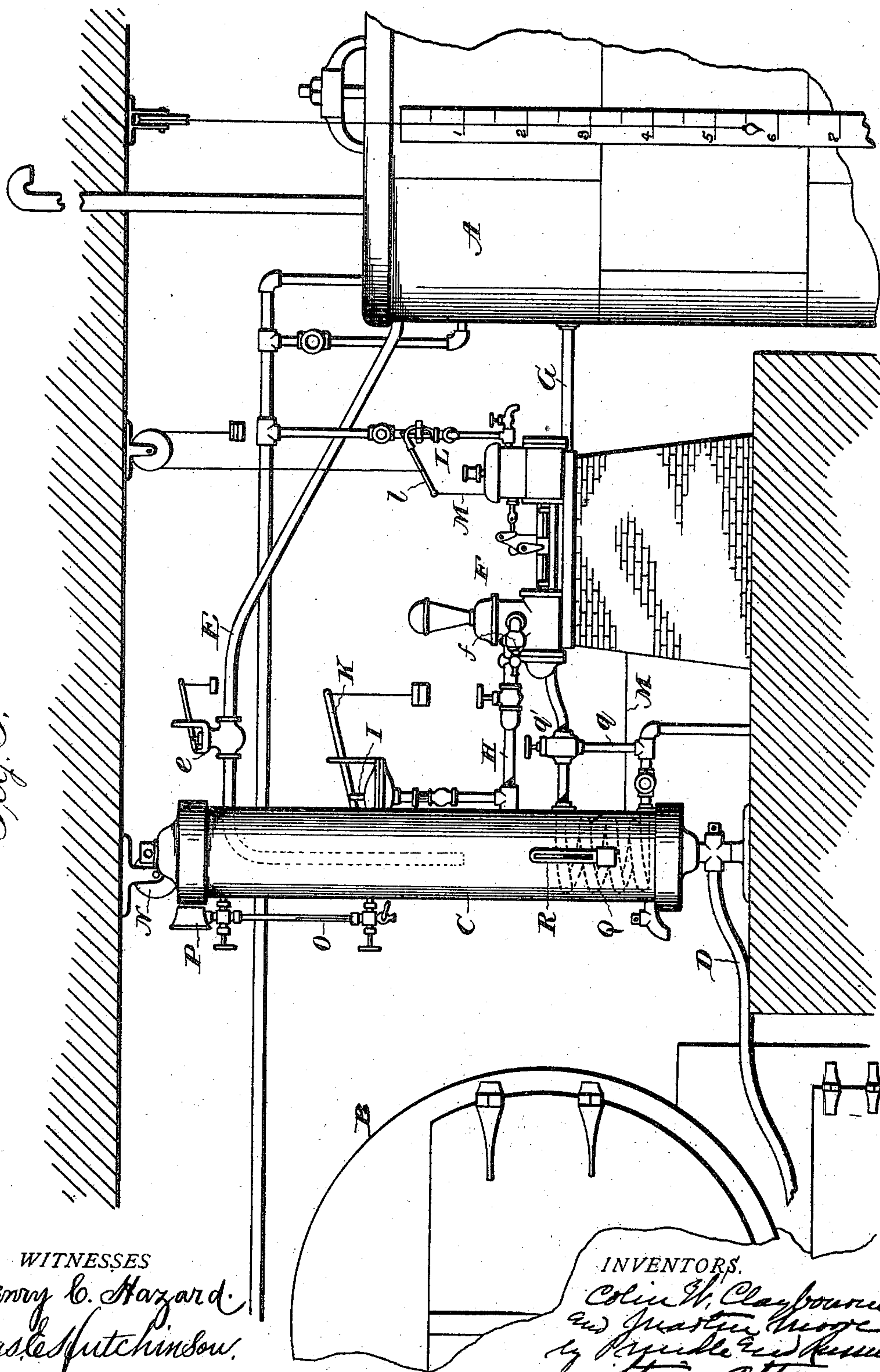
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Fig. 3.



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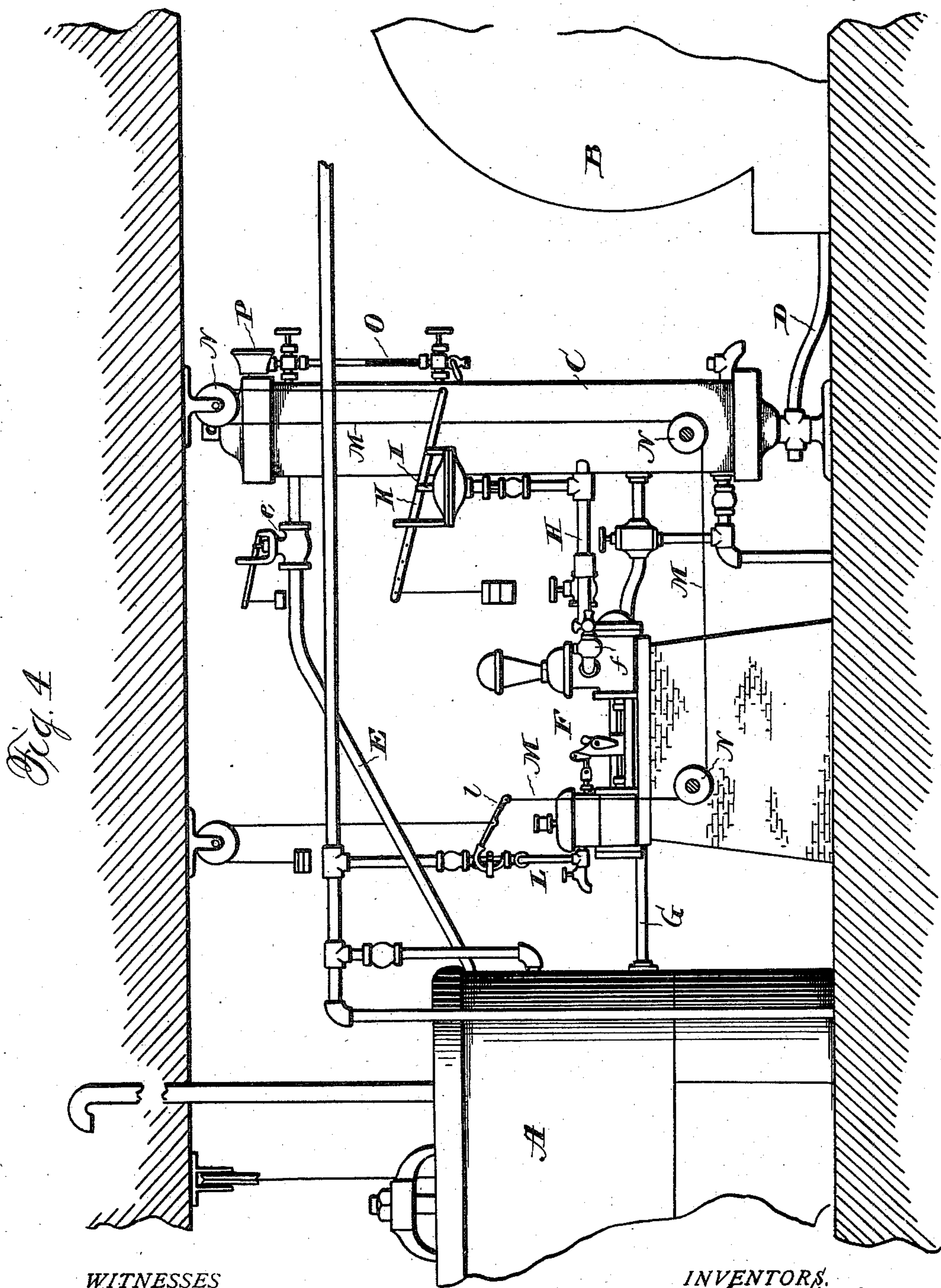
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UNITED STATES PATENT OFFICE.

COLIN W. CLAYBOURNE, OF INDIANAPOLIS, INDIANA, AND MARTIN MOORE,
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COMPANY, OF CHICAGO, ILLINOIS.

MECHANISM FOR BURNING OIL.

SPECIFICATION forming part of Letters Patent No. 572,866, dated December 8, 1896.

Application filed March 28, 1895. Serial No. 543,472. (No model.)

To all whom it may concern:

Be it known that we, COLIN W. CLAYBOURNE, of Indianapolis, in the county of Marion, State of Indiana, and MARTIN MOORE, of Detroit, in the county of Wayne, and in the State of Michigan, have invented certain new and useful Improvements in Mechanism for Burning Oil; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of our mechanism as preferably arranged for use. Fig. 2 is an elevation of the steam end of the pump, showing the connections for automatically controlling the admission of steam to the pump-cylinders; and Figs. 3 and 4 are elevations of the mechanism from opposite sides.

Letters of like name and kind refer to like parts in each of the figures.

In the use of oil as a fuel it is very desirable to have the same delivered to the burner at a uniform pressure and also to enable the pressure at which it is delivered to be capable of ready regulation to permit of the use of different pressures at different times. To accomplish these objects and also to attain them by the use of improved and efficient apparatus is the object of our invention, which invention consists in the mechanism used, substantially as and for the purpose herein-after specified.

In the carrying of our invention into use we employ, in connection with an oil-supply tank A and the fire-box of a boiler B, a receiving or pressure tank C, which preferably has the form of a cylinder, is located between said parts, and is arranged vertically with its lower end above the point at which the oil is to be delivered.

From the lower end of pressure-tank C a pipe D, controlled by a cock or valve *d*, extends to and connects with the oil burner or burners, while from near its upper end a second pipe E extends between said tank and the supply-tank A. Said pipe E passes inward through the wall of said pressure-tank and thence downward to or below its vertical center and at its ends is open, but at a point between said tanks is provided with a relief-

valve *e*, which, by means of a spring or weight pressure, is kept closed until the pressure within said tank C reaches a predetermined point, when it opens and affords communication between said tanks.

Between the supply and pressure tanks A and C, respectively, is located an oil-pump F, which is preferably operated by steam and by means of a pipe G is connected with said supply-tank A and by a pipe H is connected with the said pressure-tank C, the arrangement being such that when said pump is in action oil will be drawn from the supply-tank and forced into the pressure-tank. The connection between said pump and said pressure-tank is preferably made at or below the vertical center of the latter.

In the use of the apparatus air is first pumped into the tank C until nearly the desired pressure is secured, after which oil is pumped in and compresses still further the air until the desired pressure is reached. Should the pressure exceed the predetermined limit, the relief-valve *e* will open and oil escape into the supply-tank to remove such excess of pressure, after which said valve will automatically close.

To enable the pump F to be used to pump air into the tank, as above described, said pump is provided with a valved air inlet or inlets *f* and *f*, and the pipe G, connecting the pump and the supply-tank, is provided with a valve or valves *g* and *g*. When air is to be pumped into the pressure-tank, it is thus necessary simply to close the valves *g* and *g* and to open the air-inlets *f* and *f*.

The movements of the pump are automatically governed by means of the pressure within the tank C, through the action of a diaphragm-actuated piston-rod I, an oscillating lever K, a lever *l* upon the steam-valve L of said pump, and a cord M, which passes around suitably-arranged pulleys N, N, and N and has its ends connected with the ends of said levers K and *l*, the arrangement being such that as pressure within said tank C increases said steam-valve is correspondingly closed, while as the pressure decreases said steam-valve is in like manner and degree opened. The said pressure-tank being pro-

vided with a glass gage O and a pressure-gage P the height and the pressure of the oil contained therein may be readily seen.

With the apparatus described a constant supply of oil at a uniform pressure may be automatically supplied to a burner, so as to render practicable the obtaining of the best possible results from the use of oil as a fuel without the employment of skilled supervision.

The value of the improvements we have made, whereby the efficiency of the pressure-tank form of oil-feeding apparatus is increased, will be readily appreciated when the superiority of the pressure-tank over a stand-pipe feed is considered. Among other serious objections to which the stand-pipe is open may be stated the great height required where a high pressure is desired, which frequently necessitates its extension above the roof of the building, and in consequence the exposure of the oil to the weather; and should a greater pressure be desired than the maximum for which the pipe is erected such can only be secured by adding to the height of the pipe. By the use of a pressure-tank the oil can be supplied to the burner or burners at any pressure which may be desired within the limits of the strength of the pressure-tank, and it is insured that the delivery of the pressure selected will be uniform.

While we show and describe one construction for effecting the automatic preservation of a uniform pressure within the pressure-tank, we wish it understood that we do not limit ourselves thereto, as other means may be employed for the purpose, which will involve no departure from our invention.

It has been found advantageous to heat oil before supplying it to a burner, and for such purpose steam-coils have been placed in the usual supply or storage tanks, but such arrangement is open to serious objections, because of the production therein of gases, which by escape would involve a considerable loss in value, and in addition thereto would render the plant offensive from odors and dangerous from liability to fire.

In our apparatus steam, preferably from the exhaust of the pump, is passed through a spiral pipe Q, that is placed within the lower portion of the tank C, and is either connected with the boiler or, as shown in the drawings, constitutes a part of the regular exhaust-pipe of the pump. In order that the temperature of the oil may be regulated when exhaust-steam is used, a by-pass q extends between the inlet and exit portions of said pipe, and is provided with a valve q' , by which any portion of the whole of the steam may be caused to pass through the tank. A thermometer R,

affixed to one side of said tank, affords a ready means for ascertaining the temperature of its contents.

By our way of heating the oil, which involves the heating of but a small quantity at a time in the lower part of the pressure-tank, we not only avoid the waste in gases which is incident to the practice of heating the whole body of oil in the supply or storage tank, but we also effect a great saving in steam.

We, of course, do not limit our invention to a use only in connection with oil, as it is applicable to use with other fluids.

Having thus described our invention, what we claim is—

1. The combination of an oil-holding tank having an outlet to a burner, and means for heating oil in the tank only at, or near, said outlet, substantially as and for the purpose specified.

2. The combination of an oil-supply tank, a pressure-tank, means for conveying oil to the latter from the former, said pressure-tank having an oil-outlet at its lower end, to a burner, and a heating-coil within the tank only at the lower end thereof, substantially as and for the purpose shown.

3. The combination of an oil-supply tank, a pressure-tank to hold oil, a suitable device to force oil into said pressure-tank from the supply-tank, means for regulating the pressure in the pressure-tank, an outlet from the latter to a burner, and means for heating oil in said pressure-tank only at or near said outlet, substantially as and for the purpose specified.

4. The combination of an oil-supply tank, a pressure-tank, a steam-pump for forcing oil from the former to the latter, means operated by the pressure in the pressure-tank for controlling the movements of the pump, a heating-coil in the pressure-tank connected with the steam-exhaust of the pump, and a valved pipe connecting the pressure-tank and the supply-tank to return oil to the latter from the former when the pressure therein exceeds a certain point, substantially as and for the purpose set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 11th day of March, 1895.

COLIN W. CLAYBOURNE.
MARTIN MOORE.

Witnesses as to signature of C. W. Claybourne:

WALTER L. MILLIKEN,
J. T. CLAYBOURNE.

Witnesses as to signature of Martin Moore:

WILLIAM L. MASON,
EMMET SULLIVAN.