(No Model.)

I. JAMES.

APPARATUS FOR ENRICHING COAL GAS.

No. 309,467. Patented Dec. 16, 1884.

Fig. 1.

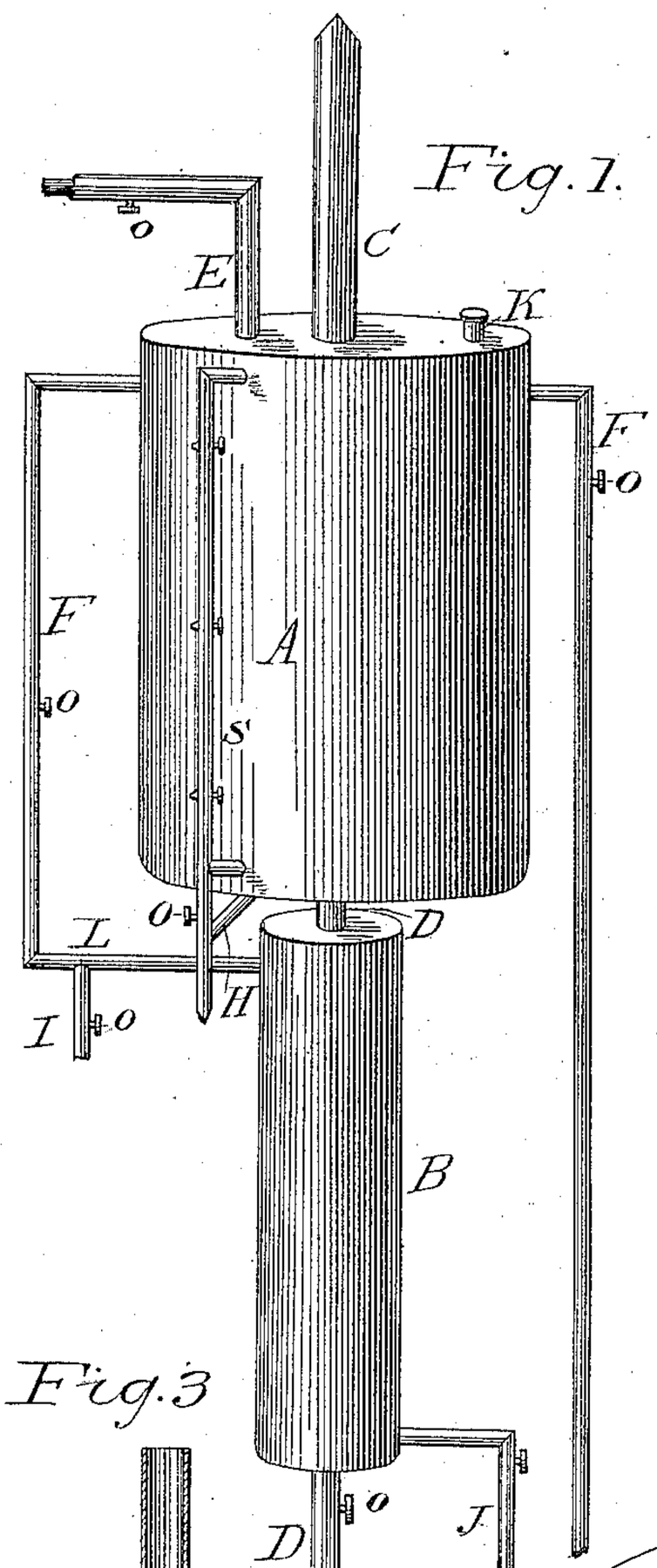


Fig. 2.

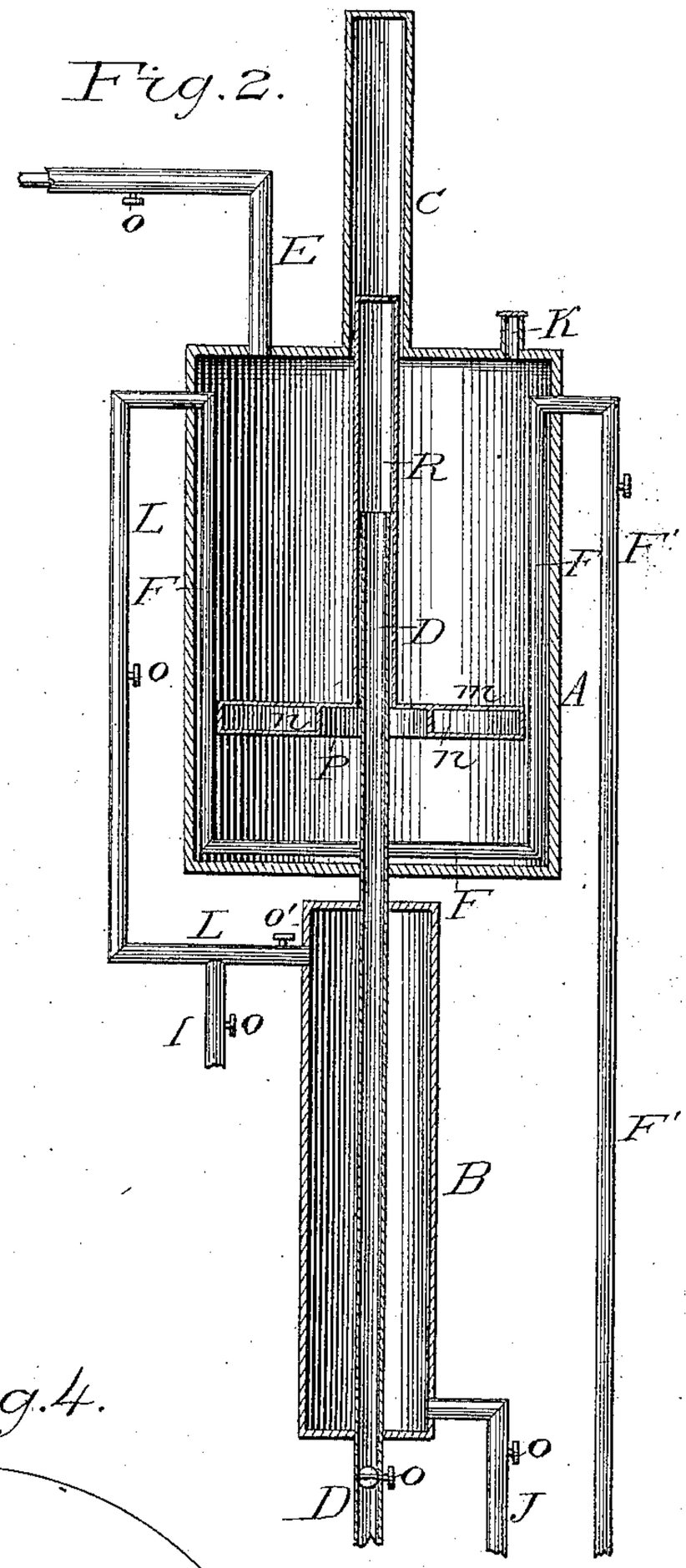


Fig. 3

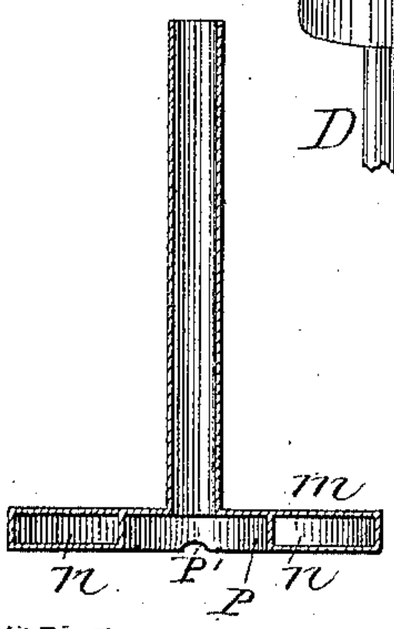
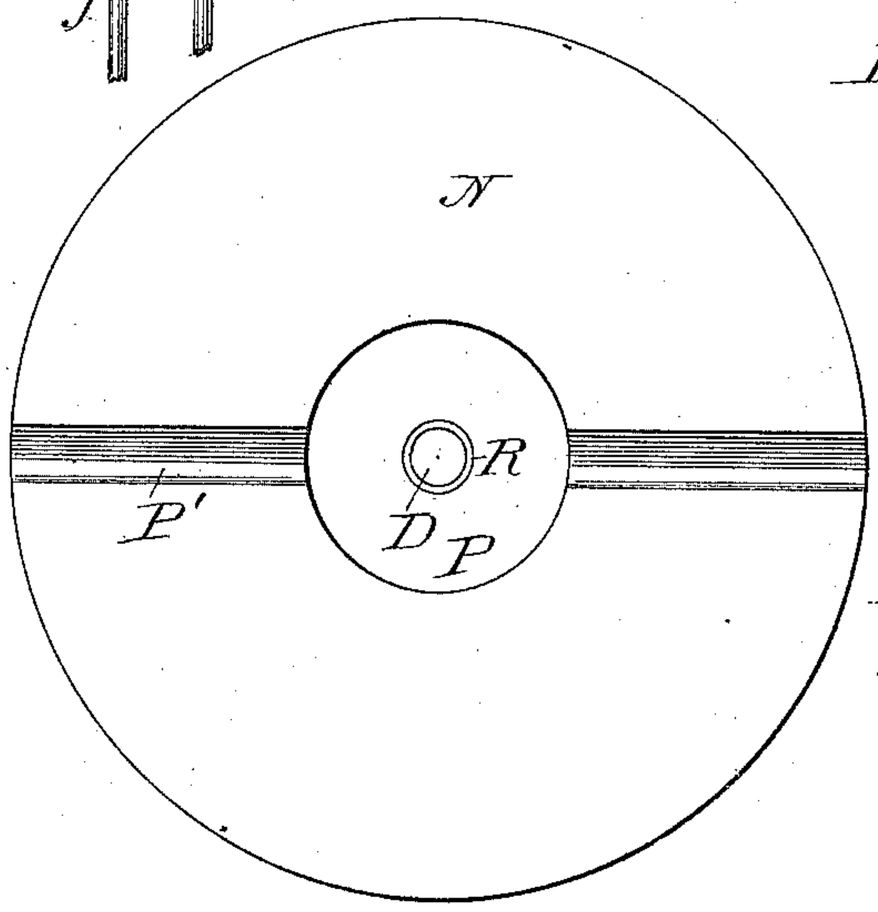


Fig. 4.



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UNITED STATES PATENT OFFICE.

IRA JAMES, OF MATTOON, ILLINOIS.

APPARATUS FOR ENRICHING GOAL-GAS.

SPECIFICATION forming part of Letters Patent No. 309,467, dated December 16, 1884.

Application filed April 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, IRA JAMES, a citizen of the United States, and a resident of Mattoon, county of Coles, State of Illinois, have invented certain new and novel improvements in apparatus for enriching coal gas in the process of manufacture by charging it with any hydrocarbon oil while in its passage from the main to the retorts, of which the following is a specification.

The object of my invention is to provide suitable means for the introduction of hydrocarbon oil or its vaporous gas in a heated state into the retorts; also to heat the gas while in its course from the main to the retort, and to carry both the gas from the main and the vaporous gas from the oil into the retort in a heated condition. I attain these objects by using the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my invention as complete. Fig. 2 is a vertical sectional view of same. Fig. 3 is a view of float. Fig. 4 is a ground plan of the float.

Similar letters indicate corresponding parts.

A is a hollow cylindrical vessel, of any suitable material, having a movable top which can be secured in position by any desired means, the said top having an elongated sleeve, C, of similar material, with a closed top. At any desired place in the top is secured the conducting-pipe E, it being a double pipe, or one pipe inclosed in a larger one.

K is a filling-pipe, also secured in the top.

D is a supply-pipe leading from the gas-main. Surrounding this is the steam jacket or cylinder B.

L is a steam-inlet pipe, and J and F are outlet or exhaust pipes. The steam-inlet pipe L passes into the vessel A and bends vertically downward, then extends across the bottom and bends upwardly again, and connects with the outlet F on opposite side. Attached at any convenient point is an indicator, S, with three or more valves. In the bottom of the vessel A is an outlet-pipe, H, connecting and leading into the lower part of the indicator S.

m is a float consisting of an air-tight chamber, *n*, and an open chamber, P, and having a hollow extension, R, with closed top, extending from the top of the float *m*. Extending across the bottom of the float *m* is a hollow groove or channel, P′. Connecting with the steam-pipe L is the pipe I, supplying steam to the same, all of the above pipes being supplied with proper valves.

To operate the above, I attach the pipe D to the main, then through the filling-tube K supply the vessel A with such quantity of hydrocarbon oil as desired, (all of the valves being closed.) I now close the valve in tube K, and having previously connected the pipe L with the steam-supply pipe I, I now, by turning the valve *o* of the pipe L, allow the steam to pass up into the pipe L and bent pipe and outlet F, thus passing the steam through the body of oil in the vessel A and heating the same, and aiding in its vaporization. Now, by opening the valve *o′* of the pipe L it allows the steam to pass into the cylinder B and through and out at J, thereby heating the pipe D and the gas in its passage from the main through it. The gas now being turned on from the main, it passes up through the heated pipe D and into the hollow extension of the float *m*, and, striking the top of said extension, it rebounds and passes down into the open chamber *p* of the float *m*, and passes out and into the oil, thence into the groove or channel P′, and is thus brought into contact with the oil beneath, and passes up and mingles with the heated vaporized hydrocarbon oil in its gaseous form in the top of the vessel A. The pipe E being double, or one pipe incased in another, the two gases now mixed are carried or conducted to the retort through the inner protected pipe, and enter the retort at a high temperature. By cutting off any portion of the groove or channel P of the float the seal can be made as close as desired, or the float can be weighted down in proportion to the pressure of the gas from the main.

The method of introducing hydrocarbon oil into gas in the course of manufacturing is not of itself new, and I do not claim such; but the manner and mechanism used herein for introducing both the gas or vapor from the oil and the gas from the main in a heated state to the retort are, I think, both new and useful.

Having thus fully described my invention,

what I claim, and desire to secure by Letters Patent of the United States, is—

The cylinder A, having sleeve C, filling-tube K, and outlet-pipe E, the float *m*, having tubular extension R, chamber P, and chamber *n*, and provided with groove P, gas-inlet pipe D, steam-cylinder B, steam-supply pipes I, F, and L, and discharge-pipes F′ and J, and discharge-pipe H, all provided with valves, all combined and connected, as described, substantially as shown, and for the purpose set forth.

In testimony that I claim the above as my own I affix my signature in the presence of two witnesses.

IRA JAMES.

In presence of—
W. S. RICE,
J. F. HUGHES.