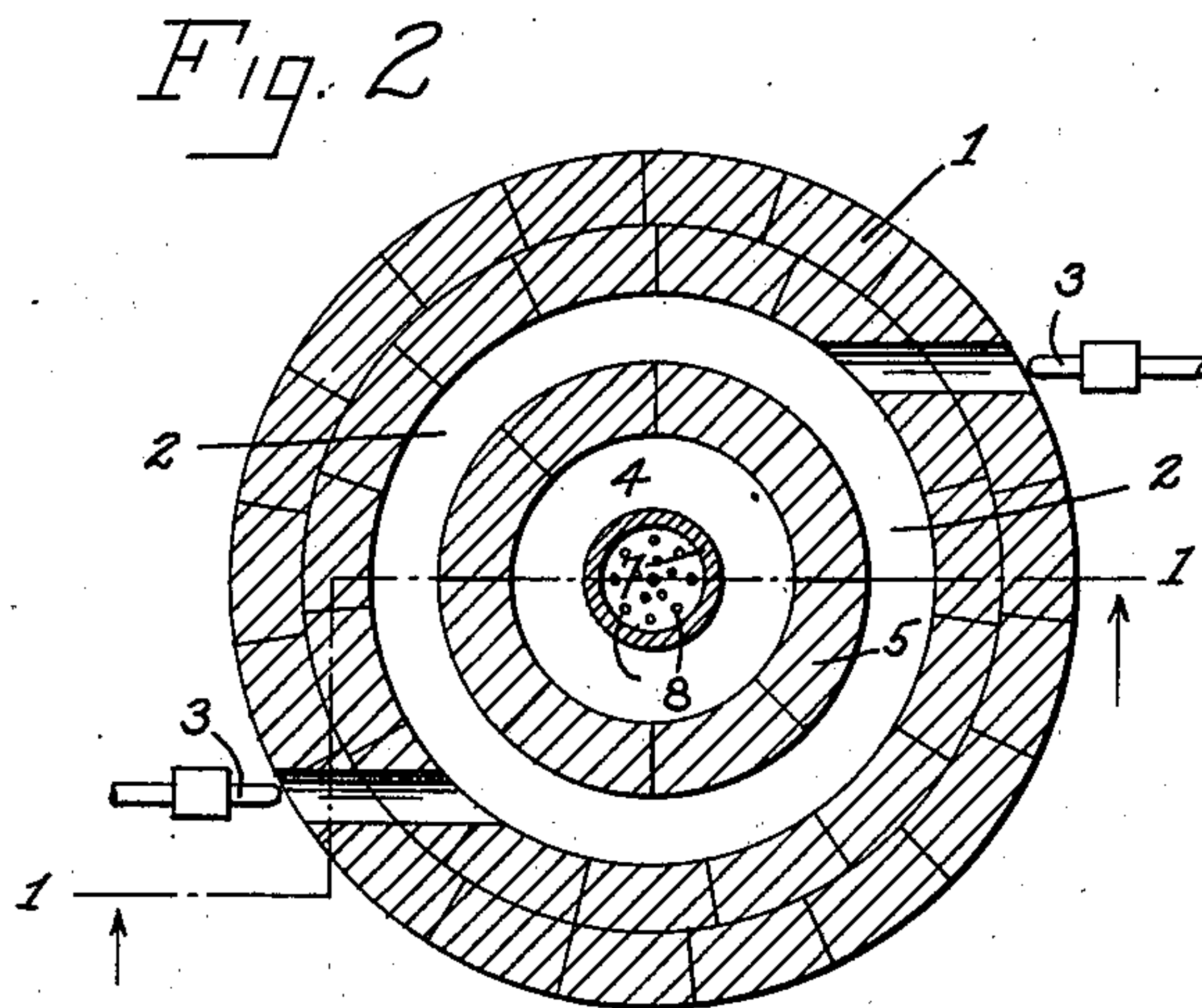
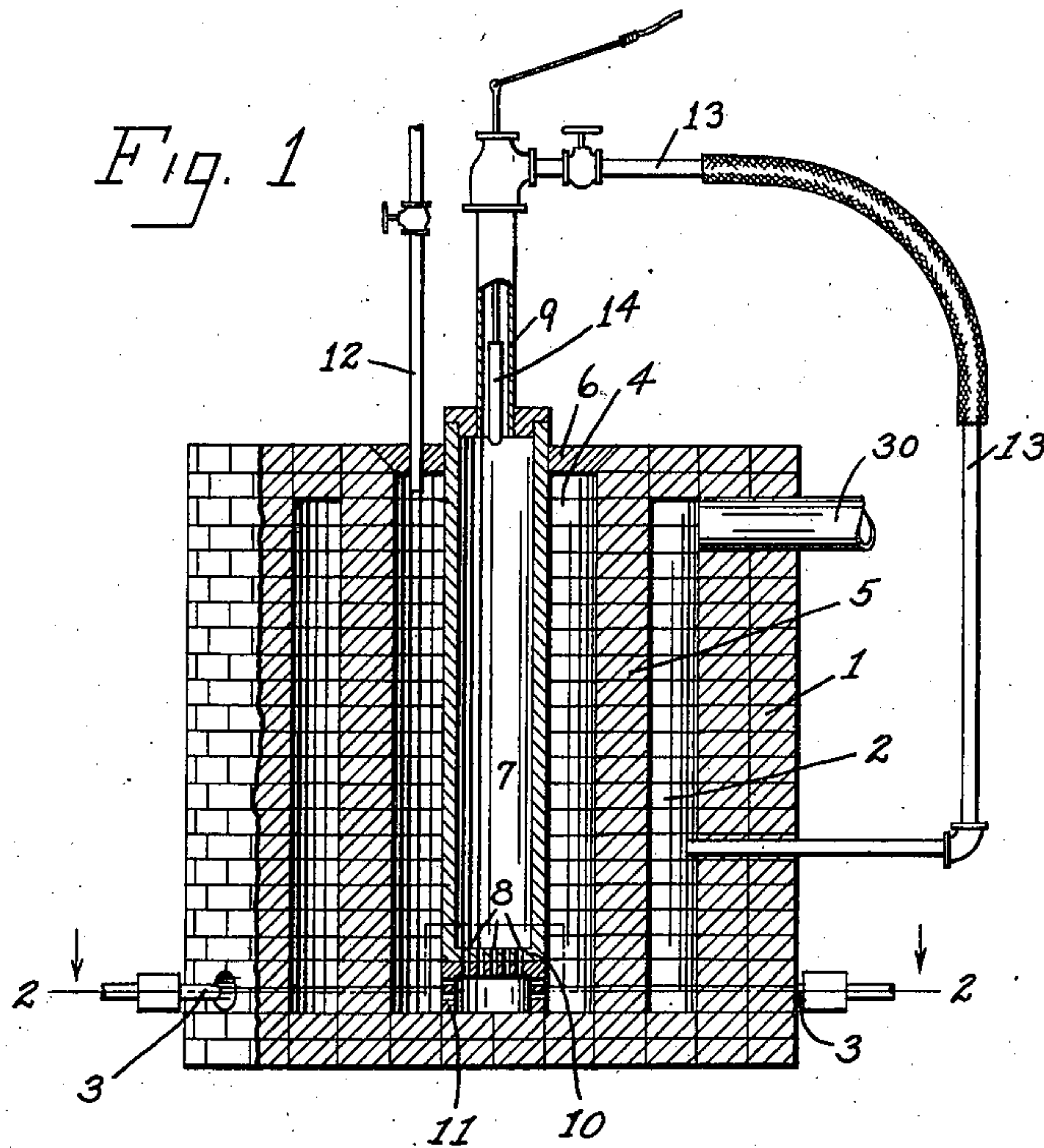


A. F. ROCKWELL.
CARBONIZING APPARATUS.
APPLICATION FILED JAN. 10, 1910.

975,077.

Patented Nov. 8, 1910.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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CARBONIZING APPARATUS.

975,077.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed January 10, 1910. Serial No. 537,192.

To all whom it may concern:

Be it known that I, ALBERT F. ROCKWELL, a citizen of the United States, residing at Bristol, county of Hartford, State of Connecticut, have invented a certain new and useful Carbonizing Apparatus, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to carbonizing apparatus, and more particularly to such apparatus in which a carbon-bearing fluid is introduced into the receptacle holding the material to be treated.

One object is to provide an apparatus in which the fluid is supplied to the material operated upon without reducing the temperature of such material.

A further object is to provide means for determining the temperature of such material.

To these ends, and also to improve generally upon apparatus of the character indicated, my invention consists in the various matters hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an elevation, on about the line 1—1 of Fig. 2, of a furnace embodying my invention; and Fig. 2 is a view on about the line 2—2 of Fig. 1.

In said drawings, 1 indicates the furnace wall which incloses the fire chamber 2. Nozzles 3 are shown for the introduction of gas or oil for heating, and the smoke pipe is indicated at 30. Within the fire chamber is a heating chamber 4, conveniently produced by a surrounding wall 5 extending from top to bottom of the furnace and having its top closed by a cover 6. A flask 7 for containing the material to be treated is located within said heating chamber. This flask is provided with inlets 8 for the introduction of the carbonizing fluid and with an outlet 9 for the escape of the same after such fluid has acted upon the material being treated. Preferably the inlets are provided in the head 10 at the bottom of the flask, the flask being in such event elevated above the floor of the heating chamber 4, as by the standard 11, and the outlet 9 is at the top of the flask. A valve-controlled inlet 12 for the carbonizing fluid enters the heating chamber 4.

The material to be treated being placed in the flask 7 and the furnace being properly heated, say until the heating chamber 4 is at a red heat, the carbonizing fluid, preferably a hydrocarbon oil, is introduced into the chamber 4. The heat of said chamber immediately converts said oil into gas and heats such gas to a high temperature, after which the gas, under the pressure which it creates in said heating chamber, enters the flask through the inlets 8 and having to force its way upwardly through the mass of material covering said inlets, intimately mingles with the material in the flask, thus carbonizing said material in a well understood manner, after which the gas escapes through the outlet 9. As the heating chamber is between the fire chamber and the flask, the temperature of the heating chamber is necessarily always as great as that of the material in the flask, and as the gas is heated in said heating chamber 4 before it flows into the flask, the incoming gas does not lower the temperature of the material in the flask; on the contrary, unless and until the material reaches the temperature of the gas, the heat of the gas itself assists in heating such material, in which event the temperature of the incoming gas assists rather than retards the operation of carbonizing or cementation. The incoming gas at no time relatively chills the material in the flask adjacent the gas inlet. Preferably the chamber 4 is air tight so that a metal flask can be employed without danger of oxidation.

If desired, the gas from the flask 7 can be utilized for heating the furnace. For example, the outlet pipe 9 can lead to the fire chamber through the pipe 13. I prefer to place a pyrometer 14 in the outlet pipe 9 near the flask so that the temperature of the gas, and, consequently, the temperature of the interior of said flask, and of the material being treated, can at all times be readily and accurately ascertained.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is—

1. A carbonizing apparatus comprising a fire chamber, a flask, a heating chamber between said flask and said fire chamber, means for introducing a carbon-bearing fluid into said heating chamber and there heating said fluid, and means for introducing such heated

fluid into said flask; substantially as described.

2. A carbonizing apparatus comprising a heating chamber, a flask surrounded by said chamber and having a fluid inlet opening into said chamber, and means for introducing a carbon-carrying fluid into said chamber; substantially as described.

3. A carbonizing apparatus comprising an air tight heating chamber, a flask in said chamber and having a fluid inlet opening into said chamber, and means for introducing a carbon-carrying fluid into said chamber; substantially as described.

4. A carbonizing apparatus comprising a flask, a heating chamber surrounding the same and having a fluid inlet opening into said flask, a fire chamber about said heating chamber, and means for introducing a carbon-carrying fluid into said heating chamber; substantially as described.

In testimony whereof, I hereunto affix my signature, in the presence of two witnesses.

ALBERT F. ROCKWELL.

Witnesses:

JOSEPH D. BROWN,
GEORGE L. SANFORD.