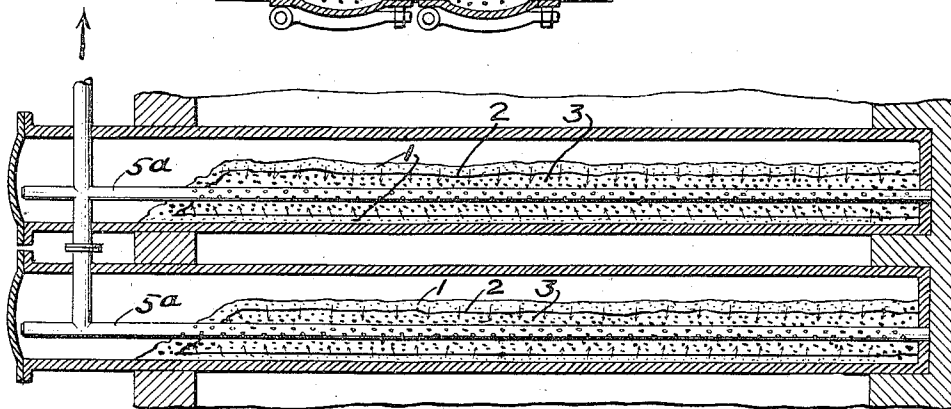
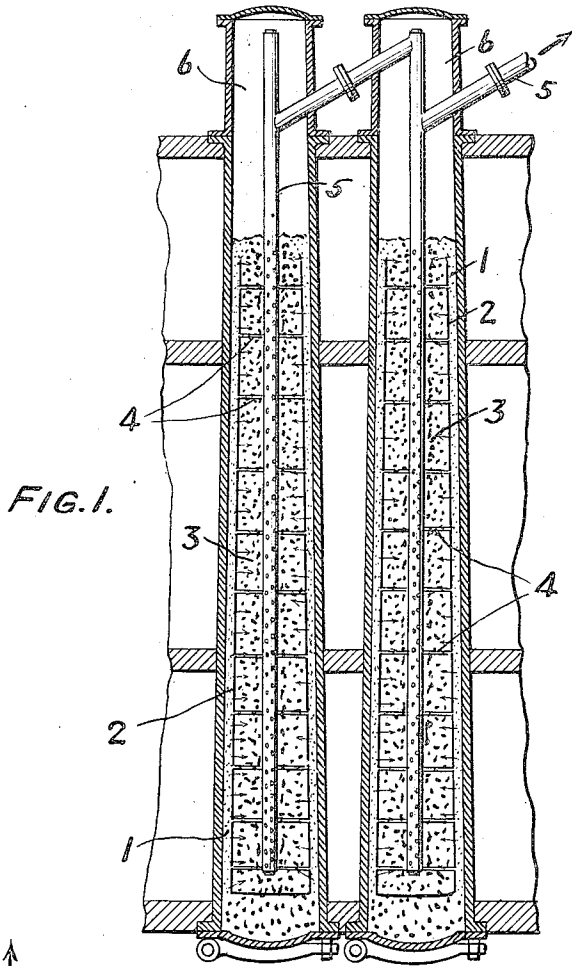


J. M. RUSBY & O. B. EVANS.
MANUFACTURE OF GAS.
APPLICATION FILED OCT. 11, 1913.

1,268,628.

Patented June 4, 1918.



WITNESSES:

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FIG. 2.

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JOHN M. RUSBY AND OWEN BROOKE EVANS, OF PHILADELPHIA, PENNSYLVANIA,
ASSIGNORS TO THE UNITED GAS IMPROVEMENT COMPANY, OF PHILADELPHIA,
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MANUFACTURE OF GAS.

1,268,628.

Specification of Letters Patent.

Patented June 4, 1918.

Application filed October 11, 1913. Serial No. 794,585.

To all whom it may concern:

Be it known that we, JOHN M. RUSBY and OWEN BROOKE EVANS, both citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly invented certain new and useful Improvements in the Manufacture of Gas, of which the following is a specification.

In the manufacture of gas coal melts and is thereafter converted into coke. The melted coal forms a plastic layer which resists the passage through it of gas and which is located between the comparatively hot and comparatively cool faces or portions of the mass or body from which gas is being distilled or driven off by the application of heat. This plastic layer of melted coal by opposing the passage of gas through it from the hotter to the cooler part of the charge causes the gas or some of it to traverse the hotter instead of the cooler part of the charge and it is well known that it is not desirable to subject the gas to high heat or to overheat it, since by doing so some of its valuable constituents are lost or destroyed.

The principal object of the present invention is to compel the gas to pass from the hotter to the cooler portion of the mass of coal and to travel by way of the cooler portion of the mass of coal through and away from the same for use, or in other words, the principal object of the invention is to avoid overheating the gas by causing it to pass from the hotter portion of the charge, usually the coke, past the melted portion of the charge to the cooler portion of the charge, which is usually coal, and to be led away through the comparatively cool coal.

The invention will be claimed at the end hereof but will be first described in connection with the accompanying drawings forming part hereof and in which—

Figure 1, is a longitudinal sectional view of vertical retorts embodying features of the invention, and

Fig. 2, is a sectional view of horizontal retorts embodying features of the invention.

In the drawings the charge which originally consisted of coal, in the process of distillation, is converted into a layer of coke 1, a layer of melted coal 2 (shown by

lines because very thin) and a layer of comparatively cool coal 3. These layers represent the stages through which the original coal passes during the process of carbonization and the position of the layers is generally parallel with the retort surface, or otherwise stated the position of the layers is at right angles to the direction of heat flow. This corresponds to the condition of the charge when heated for the production of gas and it may be said that much gas is made in the layer 1, although it has been referred to as coke and some gas is made in the layer 3. For the sake of further description it may be said that the coke of the layer 1 and the melted coal of the layer 2 are formed from the coal of the charge, by the application of heat and that the layer of comparatively cool coal 3 is a part of the charge. In the drawings the layer 1 is shown by comparatively fine stipple, the layer 3 by comparatively coarse stipple and the layer 2 by a single line. Of course this of necessity is more or less conventional, since in fact the layers merge more or less into each other. The layer 1 at the outside of the charge is of course much hotter than the layer 3 at the interior of the charge and these two layers are separated by the layer of melted coal 2, which resists or opposes the passage of gas through or past it. By the present invention, gas generated in the layer 1 is made to pass the layer 2 in either of two ways or by a combination of both. The first way, Fig. 1, is to distribute at intervals throughout the mass of the charge, generally horizontal layers or bodies 4 or porous refractory, *i. e.* non-melting material as coke traversing the charge from its heated or hotter face to its cooler or interior portion. In the drawing the layers 4 are shown to merge into the layer 1, in order to convey an understanding that the layers 4 consist of coke previously made and introduced with the charge, whereas the layer 1 consists of coke formed in the retort from the charge. These layers, bodies or masses 4, may be introduced by charging them alternately with coal, and since they are of non-melting material they do not melt and thus they afford ways of easy passage for the gas from the layer 1 to the layer 3. The second way, Fig. 2, is to provide a differ-

ence in pressure on the representative sides of the layer 2, sufficient to drive the gas generated in the layer 1 past the layer 2 and to the layer 3. 5, are offtakes structurally closed from communication with the interior of the retorts at the ends from which gas is taken and these offtakes have communication as by way of perforations with the interior portion of the charge but they have no direct communication with the interior of the retort 6. If these off-takes 5, are connected with an exhaustor or if there is gas pressure in the retorts and the off-takes are simply connected to bridge pipes, there is a difference in pressure which causes the gas to travel from the layer 1, past the layer 2, to the cool layer 3, and thence through that layer and the off-take 5. As shown in Fig. 2, the off-takes 5^a, are horizontal instead of vertical.

It will be obvious to those skilled in the art that modifications may be made in details without departing from the spirit of the invention, hence the same is not limited further than the prior state of the art may require.

We claim:

1. In the process of making gas by the distillation of coal or the like the improvement which consists in providing layers or bodies of porous non-melting material traversing the charge of coal from its heated face to its cooler portion and extending through the intermediate layer of melted coal, and leading off the gas from the hotter to the

cooler portions of the charge by way of said layers or bodies.

2. In the process of making gas by the distillation of coal or the like, the improvement which consists in heating the charge in a retort, providing an offtake passage out of direct communication with the hotter surface of the charge and in direct communication with the cooler surface of the charge, providing layers or bodies of porous non-melting material traversing the charge and extending through the layer of melted coal from the hotter surface of the charge to the offtake passage at the cooler surface, and leading gas by way of said layers or bodies from the hotter to the cooler part of the charge.

3. In the manufacture of gas by the distillation of coal that improvement which consists in subjecting the gas to a sufficient pressure to overcome the resistance of the layer of melted coal and thereby forcing the gas to pass through said layer from the hotter to the cooler portions of the charge, and leading off the gas from and through the cooler portion of the charge, substantially as described.

In testimony whereof we have hereunto signed our names.

JOHN M. RUSBY.
OWEN BROOKE EVANS.

Witnesses:

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FRANK E. FRENCH.