To all whom it may concern:

Be it known that I, Heinrich Begemann, a subject of the Emperor of Germany, residing at Portland, in the county of Cumberland and State of Maine, have invented a new and useful Apparatus for the Manufacture of Gas, of which the following is a specification.

This invention relates to an apparatus for the manufacture of gas and particularly to such an apparatus of the continuous type.

In this type of apparatus coal is introduced near the top of a highly heated retort and moves slowly downward through the retort, the gas in the coal being driven off as the coal moves downward. The coal is thus gradually converted to coke which is removed from the lower end of the retort by suitable extracting mechanism.

In apparatus of this type heretofore used much difficulty has been caused by the blocking of the coal or coke within the retort, this blocking of the retort necessitating more or less frequent interruptions in the other wise continuous operations. Whenever the charge became blocked, it was necessary to open the retort and to loosen the charge by direct manual labor.

It is the object of my present invention to provide means for forcing the coal positively downward in the retort, thus avoiding the possibility of blocking the retort.

With this object in view, my invention contemplates the provision of a plunger in the upper part of the retort, together with means for forcing the plunger downward, and additional means for withdrawing the plunger.

My invention further comprises certain devices, arrangements, and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claim.

Preferred forms of my invention are shown in the drawings in which—

Figure 1 is a vertical sectional view of a retort with my improvements embodied therein;

Fig. 2 is a view similar to Fig. 1 but showing the plunger in its lower position; and

Fig. 3 is a partial sectional elevation showing a modified form of my invention.

Referring to Fig. 1, I have shown my invention as applied to a heated retort 10 having an alined upward extension 11 with a coal inlet 12 near its extreme upper end.

A slide 13 provides means for closing the coal inlet when desired. A gas outlet 14 is attached near the lower end of the upward extension, the gas passing through perforations in the wall of the extension 11 and through the outlet 14 to a pipe 15. A door 16 is also provided for cleaning purposes.

The retort 10 extends downwardly through a plurality of heating flues or chambers 17 and communicates at its lower end with a section 18 containing any suitable mechanism for extracting the coke from the retort.

This mechanism may include a spiral screw 19 as shown in dotted lines in Fig. 1 or may be of any other common type.

In the usual operation of a retort of this type the coal passes gradually downward and is converted into coke during its passage through the heated portion of the retort, the change in the character of the charge being indicated upon the drawing.

While this change is taking place, the gas admitted in the charge is driven off and passes through the outlet 14 to the pipe 15 by which it is conveyed to any desired point.

In order to prevent the blocking of the coal and coke within the retort, I extend the portion 11 above the coal inlet 12 to provide a space for receiving a plunger 20 having a rod 21 fixed thereto. The rod 21 extends through a closely fitting bearing 22 in the cap 23 upon the upper end of the retort.

Weights 24 may be placed upon the plunger to increase its operative effect and the upper end of the rod 21 may be connected to any suitable devices for raising the plunger. In Figs. 1 and 2, I have indicated a rope and pulley mechanism for raising the plunger, the rope 25 being connected to an electric motor 26.

In the operation of a retort having my invention applied thereto the plunger is first raised to the position shown in Fig. 1, after which the slide 13 is raised to permit a charge of coal to pass into the section 11.

When a sufficient amount of coal has been admitted, the slide 13 is lowered to close the coal inlet 12 and the plunger 20 is allowed to rest its weight upon the charge.

As the coke is extracted from the lower
end of the retort, the plunger forces the coal positively downward thus preventing either the coal or coke from blocking the retort.

This operation continues until the plunger reaches the position shown in Fig. 2, after which the plunger is raised by the operation of the motor 26 or in any other convenient manner, and an additional supply of coal is then admitted through the inlet 12.

The raising of the plunger 20 does not perceptibly interfere with the operation of the retort, which is substantially continuous.

In the modified form of my invention shown in Fig. 3 the weights 24 are omitted and the upper end of the rod 30 is provided with a piston 31 slideable in a cylinder 32. The opposite ends of this cylinder are connected by pipes 33 and 34 to receive and exhaust compressed air or steam.

When pressure is thus applied to the upper surface of the piston 31 the plunger will be forced positively downward and will operate in the manner already described with reference to the form shown in Fig. 1. After the plunger has reached its lower limit of travel, pressure may be applied beneath the piston to move it again to its upper position.

The principle of operation is identical in each of the two forms of apparatus which may also be arranged for operation at an angle to the vertical if desired.

Having thus described my invention it will be evident that other changes and modifications can be made therein by those skilled in the art without departing from the spirit and scope of my invention as set forth in the claim, and I do not wish to be limited to the details herein disclosed, but what I do claim is:

In an apparatus for the manufacture of gas, in combination, an externally heated retort for the distillation of coal having a cylindrical upper portion, a lateral coal inlet in the side of said cylindrical portion and spaced from its upper end, a gas outlet also in said cylindrical portion but below the coal inlet, means for heating said retort, a plunger closely fitting said cylindrical portion and movable downwardly past said coal inlet to force the coal through the retort, a straight vertically movable rod fixed to the plunger effective to position said plunger and direct its vertical movement, a cap forming a closure for the upper end of said cylindrical extension and having a close fitting bearing for said rod, means to raise said rod and plunger vertically upward thereby moving said plunger to its normal inoperative position at the upper end of said cylindrical portion and above the coal inlet, and means to prevent discharge of coal from said coal inlet when the plunger is below the inlet.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

HEINRICH BEGEMANN.

 Witnesses:
BURTON M. CLOUGH,
THOMAS A. SANDERS.