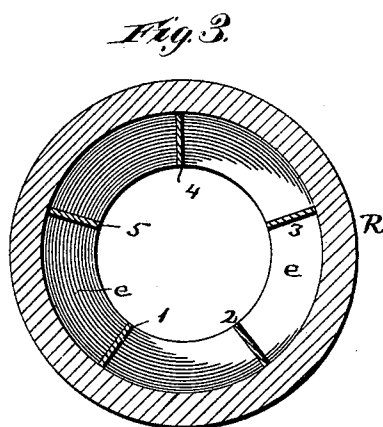
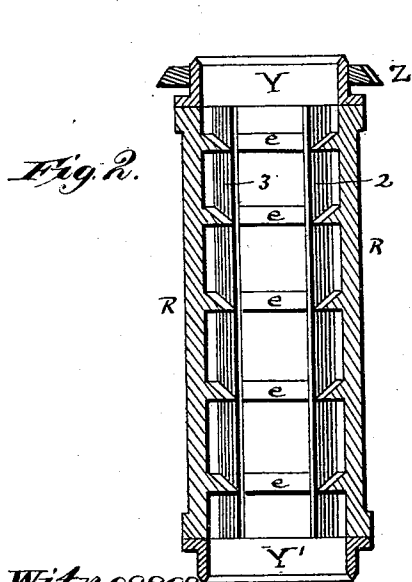
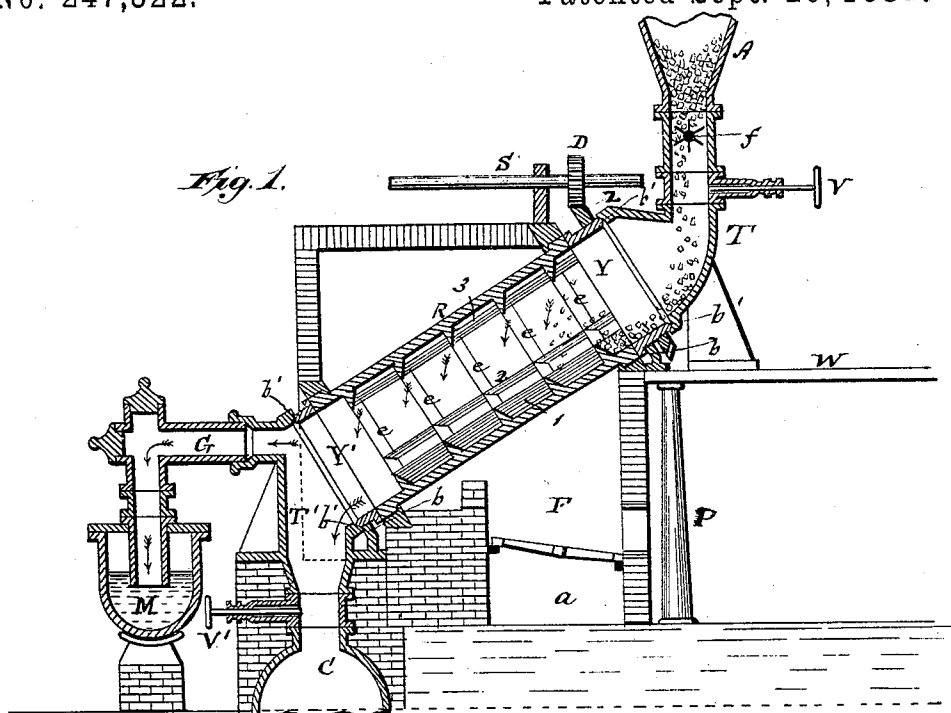


(No Model.)

F. EGNER.
GAS RETORT.

No. 247,322.

Patented Sept. 20, 1881.



Witnesses,

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UNITED STATES PATENT OFFICE.

FREDERIC EGNER, OF NORFOLK, VIRGINIA.

GAS-RETORT.

SPECIFICATION forming part of Letters Patent No. 247,322, dated September 20, 1881.

Application filed July 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC EGNER, of Norfolk, Virginia, have invented certain new and useful Improvements in Gas-Retorts, of which the following is a specification.

It is my object in this invention to obtain a gas-retort in which gas may be made continuously, doing away with the ordinary method of charging retorts, which involves much labor and delay, and is at all times detrimental to the health of the men engaged in the work.

To this end I have devised a rotary retort which is divided transversely into a series of sections by means of internal flanges (either in the shape of rings or a continuous spiral lip or thread) formed or secured on the inside of the retort, these sections being subdivided into chambers or pockets by means of walls or partitions on the inside of and extending lengthwise of the retort. By this means I form on the inner wall of the retort a series of coal-holding pockets, which are so arranged that during the rotation of the retort the coal will, as it is carried around in the pockets, drop from those of one series above into those of the next succeeding row or series below, and in this way I gradually carry the coal from the feed or inlet end to the discharge end of the retort, the coal during its passage through the retort being converted into coke, which passes from the lower or discharge end of the retort into a coke chamber or receiver, from which it may be removed by any suitable means. The retort is charged from a hopper or reservoir communicating with its upper or inlet end, and the feed of coal to the retort from the hopper may be so regulated with respect to the discharge of coke from the outlet end of the retort as to render the gas-making operation continuous.

The nature of my invention and the manner in which the same is or may be carried into effect will be understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional view of an apparatus embodying my improvements in its preferred form. Fig. 2 is a longitudinal central section on an enlarged scale. Fig. 3 is a transverse section of the retort on an enlarged scale.

R represents the body of the retort, preferably of cylindrical shape, and made of fire-clay or iron, terminating in cylindrical iron ends

Y Y', which are fast to and form part of the retort. The retort is supported by half-bearings b, on which the ends Y Y' rest and move.

The inner wall of the retort is lined with a series of compartments or pockets formed on or fastened to the retort. These pockets may be made in various ways. One convenient manner of producing them is represented in the drawings. The retort is divided transversely into a number of sections by means of annular lips or flanges e, and these sections are again subdivided by means of longitudinal ribs or partition-pieces 1 2 3 4 5. When the pockets are thus formed it is necessary, in order to deliver the coal from the pockets of one section to the pockets of the next succeeding section, to set the retort in the inclined position shown in Fig. 1, with its inlet end considerably higher than its discharge end, so that the upper pockets of one section will overhang wholly or in part the lower pockets of the section next following. I prefer the form of pockets shown, owing to the ease with which they may be constructed. Manifestly, however, I can, in lieu of having separate annular rings or ledges e, use a continuous spiral ledge or flange extending on the inner wall of the retort from end to end. Partitions 1 2, &c., would subdivide the spiral passage formed by that spiral flange into pockets, which, in event of the retort being rotated, would act to transfer the coal gradually from one end to the other of the retort, and in this case the retort need not be set at an inclination, but could occupy a horizontal position.

The retort is closed at its upper end by a fixed or stationary cap or mouth piece, T, and at its lower end by a fixed or stationary cap or mouth piece, T', with which the parts Y Y' make gas-tight joints by means of the V-shaped bearings b'. The bearings b support in great measure the weight of the retort, while the lower fixed mouth-piece, T', is sufficiently strong and securely placed in position to withstand any end-thrust of the retort which may come upon it.

The upper mouth-piece is surmounted by the coal hopper or reservoir A, the cylindrical lower end of which is bolted to a like-shaped opening in the mouth-piece. This coal-reservoir is intended to be of a capacity to hold a considerable quantity of coal, and is tightly closed at

the top when the apparatus is in operation. The means for thus closing it are the same as those now in general use for closing gas-retorts, and do not require to be represented. The tubular lower end of the hopper is provided with a revolving six-armed gate, *f*, which regulates the feed of the coal, and below the gate *f* with a valve, *V*, by which communication between the coal-reservoir can be opened or closed at pleasure.

The lower mouth-piece, *T'*, is in communication at its top with the pipe *G*, through which the gas is conducted from the retort to the hydraulic main *M*, and at its lower end is formed, as shown, with a tubular extension which opens into the coke-chamber *C*, and carries a valve, *V'*, by which communication between the mouth-piece and coke-chamber can be opened and closed. The coke-chamber, like the coal-reservoir *A*, is to be closed air-tight when the apparatus is in operation, in the same manner as gas-retorts are now generally closed.

Rotary movement may be imparted to the retort by any suitable means. In the apparatus shown in the drawings provision is made for obtaining this movement by fixing on the upper end of the retort a large beveled-tooth wheel, *Z*, which is engaged by a beveled gear, *D*, on the power-driven shaft *S*. This shaft has an extension (not deemed necessary to be represented) which, by means of ordinary gearing, engages and rotates the shaft or axle of the gate *f* for the purpose of imparting rotary movement to the gate when the apparatus is in operation.

The retort and parts connected therewith are suitably supported in place by masonry, the retort being placed in a furnace, as usual.

In the drawings, *F* represents the furnace, and *a* the ash-pit of the same. *W* represents beams, and *P* beam-supporting columns, all of which support the upper end of a retort and machinery connected therewith.

The operation is as follows: The retort being heated and valve *V* and coke-chamber *C* being closed, the reservoir *A* is filled with coal, and is then closed also. Valve *V* is now opened, and at the same time shaft *S* is put in motion so as to slowly revolve the retort, and at the same time to rotate the gate which regulates the feed. Coal is in this way admitted to the upper series of pockets. As the retort revolves this coal is, by pockets, carried up until, reaching the point where the pockets will

empty themselves, the coal, now partly carbonized, will fall or drop into the lower chamber or pockets of the next succeeding series, and so on until it finally reaches the end of the retort and falls from thence into the coke-chamber *C*. Thus coal, so long as there is any in the reservoir, is passing gradually and constantly in measured quantity through the retort, and is at the same time turned over and over, so that all pieces will be equally exposed to the heat. When the coal-reservoir *A* is empty the valve *V* is closed and the reservoir is again filled. When the coke-chamber *C* is full the valve *V'* over it is closed, and the chamber can then be emptied and its contents carted off. In this way I am enabled to produce gas continuously and in greater quantity from the same amount of coal than is the case under the ordinary methods now in use, and at the same time I do away with the cruel labor of charging retorts as now practiced.

I have described what I believe to be the form of apparatus best calculated to carry my invention into effect. I do not, however, restrict myself to the details herein shown and specified; but

What I claim, and desire to secure by Letters Patent, is—

1. A revolving gas-generating retort provided upon its inner wall with coal holding and transferring pockets, arranged with relation to one another and for operation substantially as described, in combination with mouth-pieces closing the ends of the same, the coke-chamber communicating with one mouth-piece, the coal-reservoir communicating with the other mouth-piece, and valves whereby communication between the said reservoir and chamber and their respective mouth-pieces can be opened and closed at pleasure, substantially as hereinbefore set forth.

2. The inclined rotating gas-retort provided upon its inner wall with annular ribs or flanges, and with longitudinal partitions intersecting said ribs or flanges, in combination with the coke-chamber and coal-reservoir communicating with the closed ends of said retort, substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 29th day of June, A. D. 1881.

FREDERIC EGNER.

Witnesses:

E. A. DICK,
M. BAILEY.