

D. DAVISON.
Gas-Retorts.

No. 143,675.

Patented Oct. 14, 1873.

Fig: 2

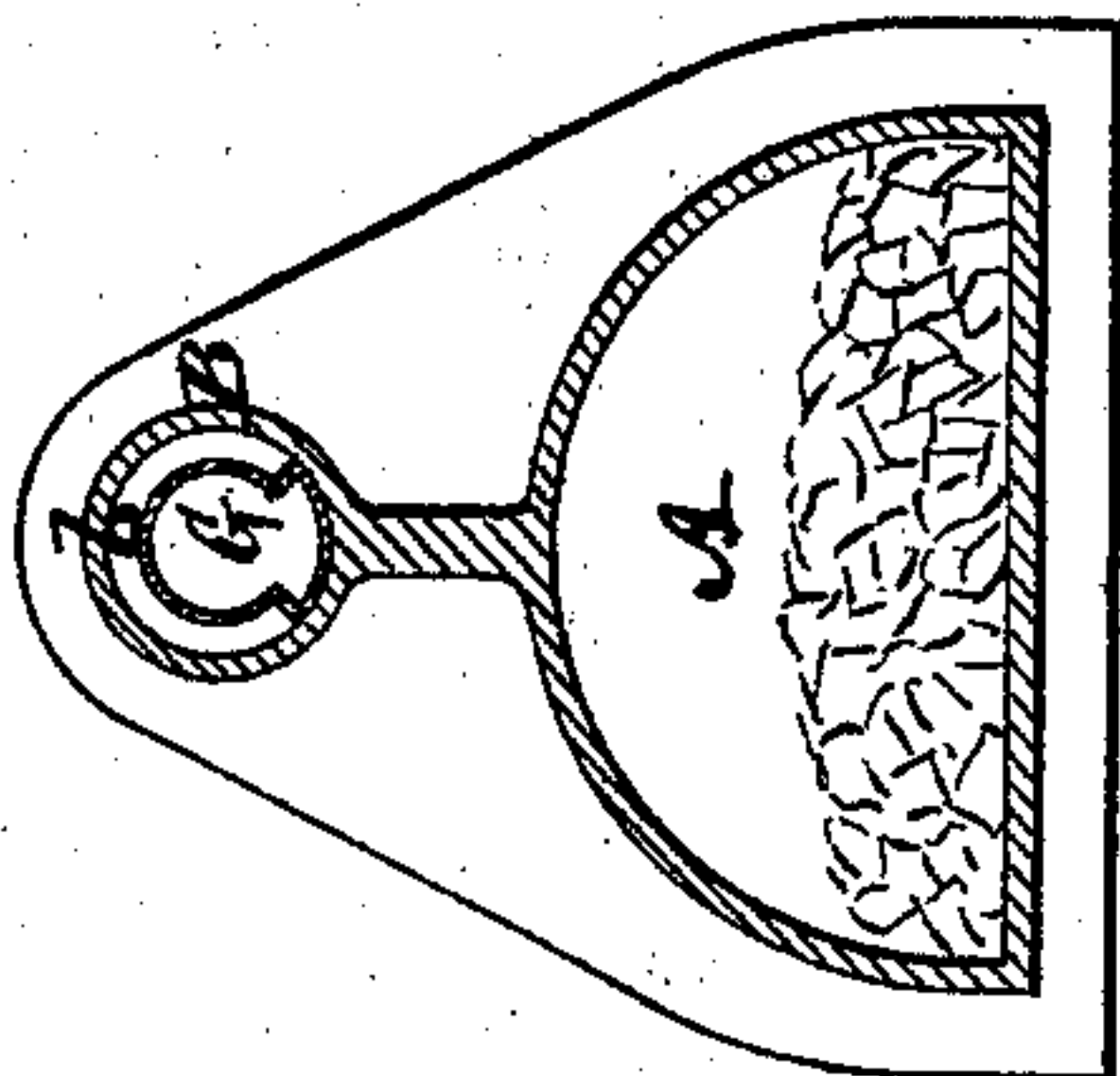
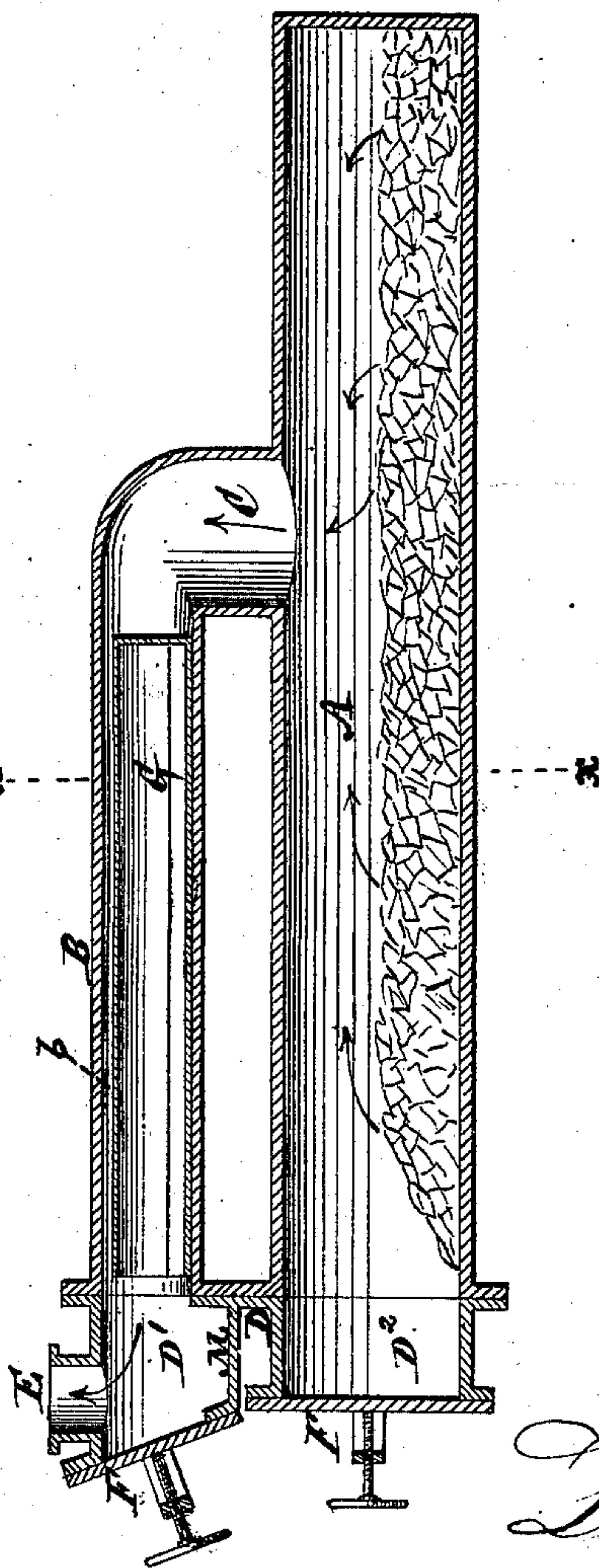


Fig: 1



Witnesses:
Michael Ryan
Fred Hays

Darius Davison
by his Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

DARIUS DAVISON, OF NEW YORK, N. Y.

IMPROVEMENT IN GAS-RETORTS.

Specification forming part of Letters Patent No. 143,675, dated October 14, 1873; application filed April 9, 1873.

To all whom it may concern:

Be it known that I, DARIUS DAVISON, of the city, county, and State of New York, have invented certain new and useful Improvements in Gas-Retorts, of which the following is a specification:

This invention relates to the distillation of coal for the production of illuminating-gas; and has for its general object the reduction or prevention of the loss, which usually occurs in retorts of ordinary construction, of the best gas-producing illuminating-oil distilled from the coal, by its passage out of the retort simply as vapor, and which is condensed in the subsequent process of producing the gas, and is run off into coal-tar; consequently is lost for conversion into gas, and is, comparatively, a waste material. The invention consists in a novel construction and combination of parts, including a pipe or opening connecting the return-pipe with the top of the main retort at or near the middle of the latter; also, a distributing core or tube, closed at its back end, and open at its front, and with a partly-annular or surrounding space between it and the interior of the return-pipe; likewise, a double-chambered and double-lidded mouth-piece, in combination with the main retort and with the return-pipe, and the upper chamber of said mouth-piece being constructed to form a depressed drip box or receptacle for the tar which drips from the stand-pipe. A gas-retort comprising these novel elements or features not only attains the general object sought, but is advantageous in other respects.

In the accompanying drawing, which forms part of this specification, Figure 1 represents a vertical longitudinal section of a gas-retort constructed in accordance with my invention, and Fig. 2 a transverse vertical section of the same on the line *x x*.

Similar letters of reference indicate corresponding parts.

A is the main retort, of an ordinary D-shaped construction, and made either of clay or iron. Arranged above said retort is a cylindrical or other suitably-shaped return-pipe, B, running toward the front of the main retort, and connected with the latter near its middle, or considerably in advance of its rear end, by a pipe or passage, C. Said return-pipe B and main

retort A are connected, at their front ends, with a cast-iron mouth-piece, D, made in one piece, and constructed to form double chambers D¹ D², the upper one, D¹, of which has mounted on it the stand pipe or outlet E for the gas, and is constructed below to leave a depressed drip box or receptacle, M, for the tar which drips from the stand-pipe E. F F are the lids to the double-chambered mouth-piece D. Within the return-pipe B is arranged a horizontal core, G, running lengthwise of the return-pipe, and which may be of cylindrical, or partly-cylindrical, shape. This central core may be either of iron or clay, and, preferably, hollow, to constitute a tube or pipe closed at its rear end. Said core or tube G partly fills the center of the return-pipe from near the front end of the latter to the connecting pipe or passage C, and, when the retort is in operation, is hot enough to make gas. Its construction is such that, while it leaves a surrounding or annular space, *b*, for the greater portion of its circumference, between it and the interior of the return-pipe, its lower portion, for from one-quarter to one-third of its circumference, or thereabout, rests upon, and is in contact with, the interior of the return-pipe, for the purpose of supporting and holding said tube G in place, and to prevent the vapor and gas which passes through the return-pipe B from coming in contact with the bottom of the return-pipe, such gas or vapor spreading itself into a comparatively thin stratum over the top and sides of the tube G, in immediate contact with the heated surfaces of the return-pipe B and tube G, for the purpose of more thoroughly and completely bringing the heavier and other vapors from the coal not convertible into gas in the main retort A into contact with such hot surfaces to be converted into gas while passing rapidly through the space *b*. The central core, pipe, or tube G is arranged loose within the return-pipe B, for the purpose of removing and replacing it, when required, without disturbing other parts to provide for cleaning.

The use of the core G prevents the return-pipe becoming choked with hard incrustated carbon, usually commencing on the bottom of the return-pipe, and gradually filling up the latter, so as to necessitate its being frequently burned out, or otherwise becoming useless. The vol-

ume of gas and illuminating power of the latter are also greatly increased by the use of the core G, which may be applied with beneficial effect to various return-pipe arrangements. By means of said core, also, less vapor and gas are burned, within the retort and its return-pipe, into fixed carbon or lamp-black for after deposit in the stand-pipe, which latter, in fact, is kept clear of all incrustations, thus doing away with a very common and great inconvenience.

On removing the lid F of the upper chamber D¹, ready access is had to the interior of the return-pipe, and facility afforded for the introduction or removal of the core G; also, provision for getting at the stand-pipe and occasional removal of the liquid tar which drips from the stand-pipe within the drip-box M, that, being arranged below the level of the bottom of the return-pipe, prevents said tar from running back into the return-pipe, and becoming incrustated in the bottom of the latter. Such tar, however, falling into the drip-box M, remains liquid, and is readily removed, as required, and does not obstruct the space for the passage of the gas to the stand-pipe.

The arrangement of the pipe C at or near the middle of the main retort provides, in a direct manner, for the more uniform travel and time of exposure of the vapors in the main retort and return-pipe, thereby producing a more equal action upon the whole body of vapor, instead

of allowing a portion of it to be burned into fixed carbon, and a portion to pass off insufficiently heated.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The arrangement, substantially as specified, of the pipe or opening C with the main retort A and return-pipe B, whereby the connection between said retort and return-pipe is established at or near the center of the retort.

2. The mouth-piece D, cast in one piece, and constructed to form upper and lower chambers D¹ D², provided with separate lids F F, in combination with the main retort A, the return-pipe B, and stand-pipe E, substantially as specified.

3. The drip-box M, formed by a depression of the upper chamber D¹ of the mouth-piece, in combination with the return-pipe B and stand-pipe E, essentially as herein described.

4. The gas-distributing core, pipe, or tube G, closed at its back end, and constructed to rest, at its bottom, upon the lower interior surface of the return-pipe B, leaving a gas or vapor space, *b*, at its sides and top, and arranged, in relation with the return-pipe, for use in concert with the main retort A, substantially as specified.

DARIUS DAVISON.

Witnesses:

MICHAEL RYAN,
FRED. HAYNES.