Darius Davison.

Impt. in Gas Retorts.

117610

PATENTED AUG 1 1871

Fig. 4

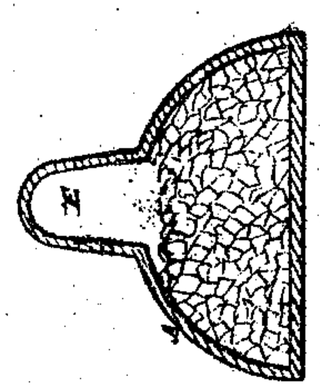


Fig. 1

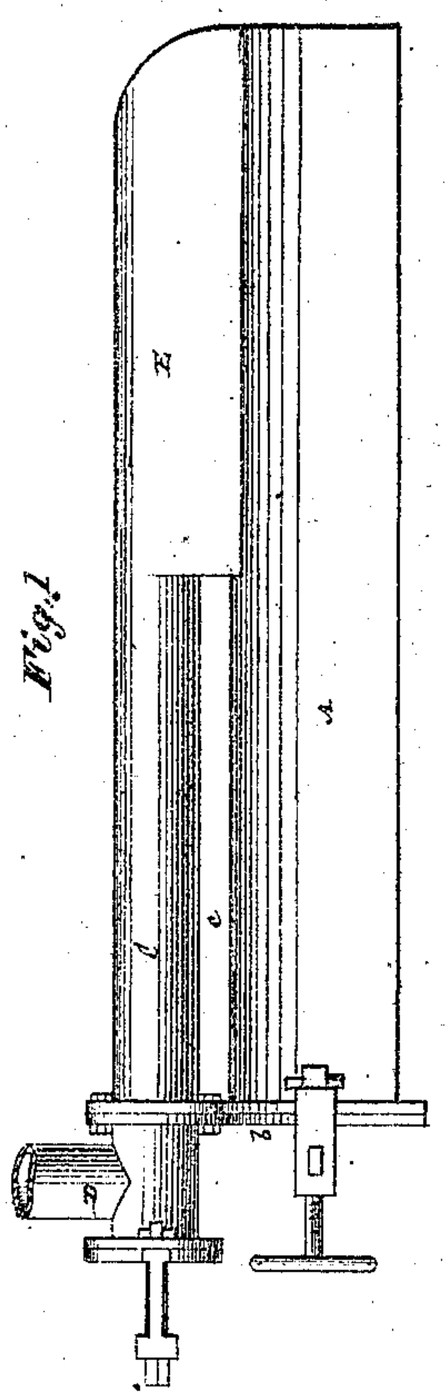


Fig. 2

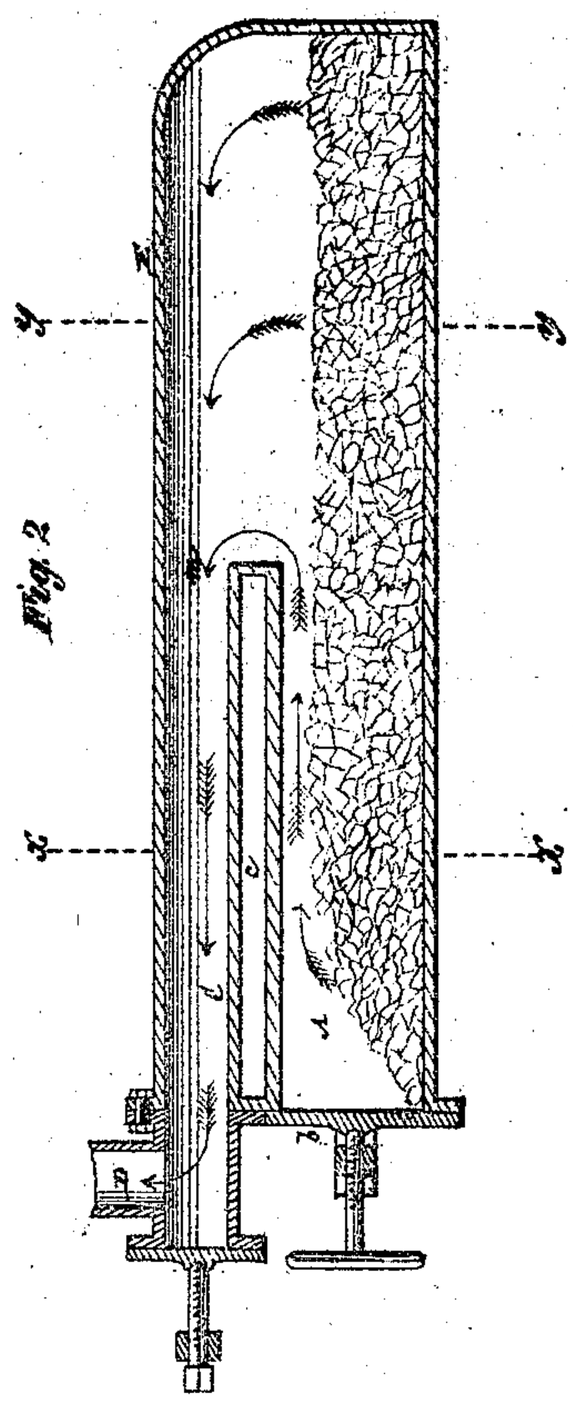
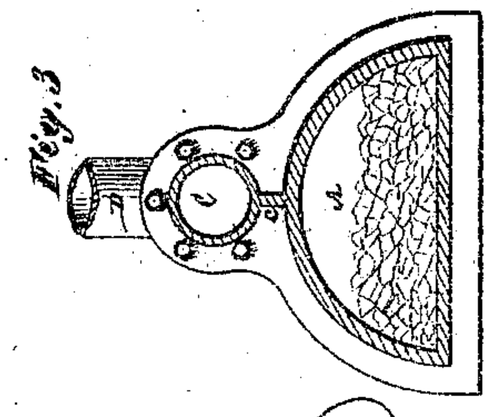


Fig. 3



Witnesses.
Fred Haynes
R. H. Rabbeth

Darius Davison

117,610

UNITED STATES PATENT OFFICE.

DARIUS DAVISON, OF NEW YORK, N. Y.

IMPROVEMENT IN GAS-RETORTS.

Specification forming part of Letters Patent No. 117,610, dated August 1, 1871.

To all whom it may concern:

Be it known that I, DARIUS DAVISON, of the city, county, and State of New York, have invented a new and useful Improvement in Gas-Retorts; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a longitudinal elevation of a gas-retort constructed in accordance with my improvement; Fig. 2, a mainly central vertical longitudinal section of the same; Fig. 3, a transverse section through the line *x x* in Fig. 2; and Fig. 4, a similar section through the line *y y*.

Similar letters of reference indicate corresponding parts throughout the several figures of the drawing, which is on a scale of about half of an inch to the foot.

This invention relates to gas-retorts, constructed in certain respects substantially as described in Letters Patent of the United States, No. 108,009, issued to me October 4, 1870, in which a return-pipe was arranged to extend the length of the main retort above the latter, with which it was connected in the rear by a contracted aperture, and had the stand-pipe mounted on its opposite end over or beyond the front portion of the main retort. By this arrangement the vapor distilled from the coal at or near the front end of the main retort had to pass nearly the whole length of the latter, and the whole length of the return-pipe before it passed from the red-hot surfaces of the main retort and secondary one or return-pipe. Such construction operates satisfactorily so far as increase in the volume of gas produced for a given temperature and with a given amount of coal is concerned, and when a moderate or low temperature is employed the advantages over or as compared with ordinary retorts are considerable. But when a very high temperature is produced in the retort, then the effect is to burn a large portion of the carbon out of the gas into the condition of fixed carbon or lamp-black. This will be apparent when it is considered that the vapor distilled near the mouth of the main retort has to pass twice the length of the combined retort, while the vapor distilled at the rear of the main retort has only to pass once the length or through the return-pipe. My present invention obviates this defect by restricting the travel of the vapor distilled at the mouth of the main retort to only half the length of the latter or thereabout, and then back for the same limited length of travel through the return-pipe, thus reducing its exposure, while the vapor distilled at the rear of the main retort has the same length of travel to and through the return-pipe. My present invention also obviates another defect incidental to the former construction. Thus, when a large or full charge of coal was placed in the main retort, the contracted opening in the rear of the latter connecting it with the return-pipe was apt to become partially or wholly choked with coal, thereby interfering with the free flow of the vapors and endangering the bursting of the retort. To remove these defects this invention consists in a novel construction of such combined main retort and return-pipe by providing the latter, that has the stand-pipe attached to it in front, with an elongated dome-shaped extension and open communication at its base with the rear portion of the main retort for about half the length of the latter.

In the accompanying drawing, A represents the main retort, and *b* its mouth end. C is the return-pipe, of a cylindrical form in its transverse section and joined to the upper surface of the main retort by a web, *c*. This return-pipe projects beyond the mouth of the main retort to allow of the attachment of the stand-pipe D in front and outside of or beyond the brick-work in which the retort is set. Said return-pipe, however, is only arranged to run about half the length of the main retort toward the rear of the latter, and is formed beyond such point into a dome-like extension, E, which is in free communication at its base with the remaining or rear half of the main retort.

By this construction the communication with the return-pipe is in a horizontal direction, as at *m*, forward through the dome-shaped extension over the coal instead of being directly vertical at the back end of the retort as in the previous construction; consequently, no matter how large the charge of coal placed in the main retort, it cannot stop the flow of the gas out of the retort. The circulation of the vapor, also, distilled from the coal at the front and back ends of the retort has an equal distance to travel and occupies the same time, or thereabout, in passing out of the retort. The distilled vapors from all other equi-

distant points forward or backward of the center of the retort likewise have similar distances to travel to pass out of the retort in an equivalent space of time. The consequence is that all the vapor distilled from the coal is more equally acted upon by the heat in the retort to convert it into illuminating-gas of a superior quality without burning the carbon contained in the gas. The dome E, too, which may be cast in one piece with the main retort and return-pipe, combined with the web *c*, serves materially to strengthen the whole structure.

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

1. The elongated dome-shaped extension E of the return-pipe C at the rear end thereof, in open communication throughout the whole length of its base with the top of the retort A, substantially as described.

2. The horizontal opening for the passage of the gas and vapor from the dome-shaped extension E into the return-pipe C, essentially as specified.

3. In a horizontal gas-retort, the arrangement of the outlet-passage of the gas and vapor from the front half of the coal in the retort into the return-pipe C at or near the middle of the retort, substantially as described.

4. The combination of the dome-shaped extension E, the return-pipe C having a horizontal communication therewith, the retort A, and the stand-pipe D, when the whole is arranged substantially as herein described.

DARIUS DAVISON.

Witnesses:
FRED HAYNES,
R. E. RABEAU.