W. Gibson,
Manf Gas'.

No. 95159. Patented. Oct. 5. 1869.

Fig: 1.

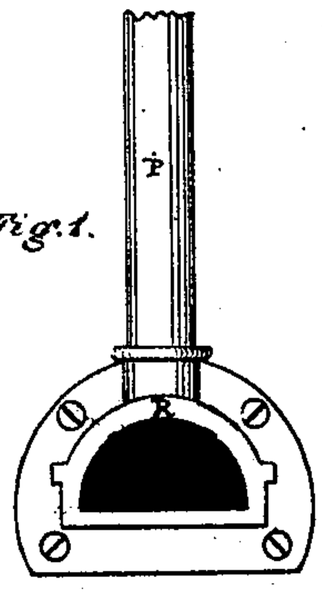


Fig: 2.

Fig: 3.

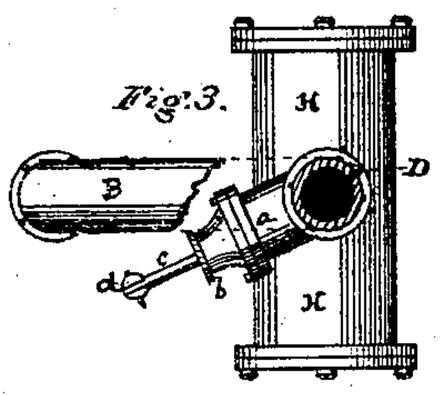
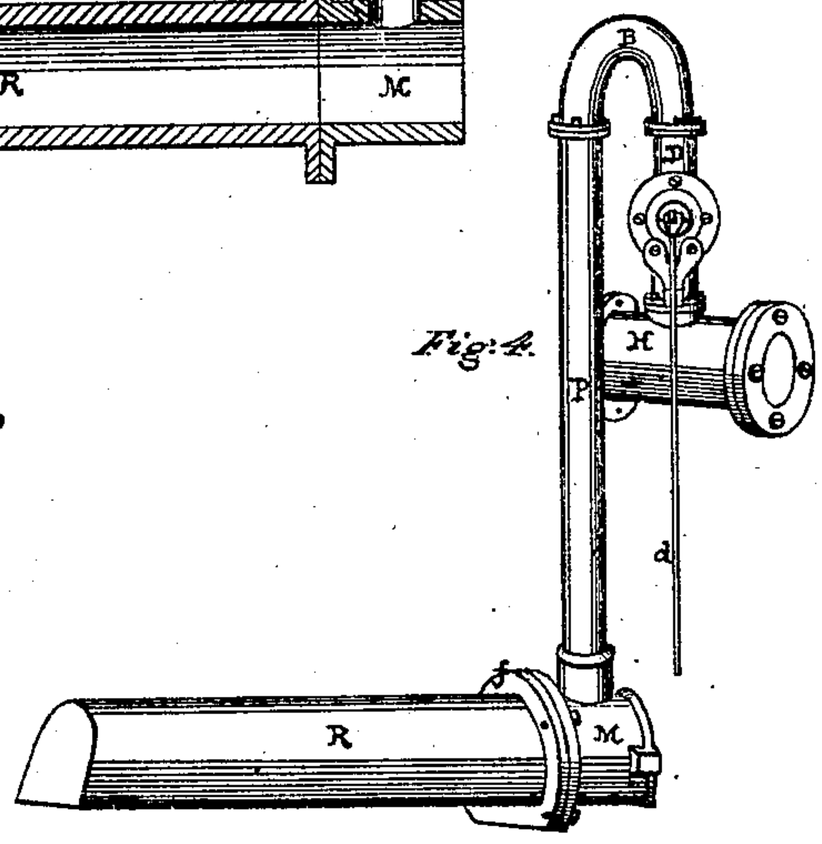


Fig: 4.



Witnesses.
F. W. Howard
A. C. Bradley

Inventor.
William Gibson
By his Attorney
Chas. F. Ramsbury

UNITED STATES PATENT OFFICE.

WILLIAM GIBSON, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN THE MANUFACTURE OF COAL-GAS.

Specification forming part of Letters Patent No. **95,459**, dated October 5, 1869.

To all whom it may concern:

Be it known that I, WILLIAM GIBSON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Apparatus for the Manufacture of Coal-Gas; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of the retort and stand-pipe. Fig. 2 is a longitudinal section of the apparatus complete. Fig. 3 is a top view or plan, partly in horizontal section, of the hydraulic main, bridge-pipe, and valve-tube. Fig. 4 is a perspective view of the apparatus complete.

The same part is marked by the same letter in the figures where it occurs.

The nature of my invention consists in substituting for the method commonly employed in gas-works, of cutting off communication between the retort and the hydraulic main during the drawing of the charge, by means of a "dip-pipe," descending into and sealed by the ammonia-water or coal-tar in the hydraulic main, the introduction of a valve at convenient point between the gas-producing coke in the retort, and the liquid contents of the hydraulic main, which valve, when closed, shall effectually arrest communication, and when open allow of the free production and flow of the gas into the main, thus obviating the great objection which lies to the dip-pipe, that the pressure under which the gas is made checks and diminishes its production, and hastens the accumulation of fixed carbon in the retorts, and thus accelerates their destruction.

The accompanying drawings clearly illustrate my invention. R marks an ordinary D-retort, connected by flange *f* with a mouth-piece, M, from which rises the stand-pipe P leading to the bridge-pipe B, provided with its bonnet *g*.

In the ordinary gas-apparatus there descends from the bridge-pipe a dip-pipe, which passes down through the shell of the hydraulic main and dips into, and is sealed by, the water or coal-tar in the lower part of the main.

I dispense entirely with this dip-pipe and replace it by the short pipe D, which leads from the bridge-pipe B to the hydraulic main H, but does not descend into the latter. This is clearly shown in Fig. 2. In the pipe D is placed a valve, V, which has its seat in a recess, *h*, in the side of pipe D, and works in a short tube, *a*, projecting at right angles from the opposite side of that pipe, as seen in Figs. 2 and 3. The valve-stem *c* passes out through a stuffing-box, *b*, and is pivoted to the long descending lever *d*, by which the movements of the valve are controlled. This lever has its fulcrum in the end of the hinged stanchion *e*. In order to give easy access and free play to this lever, the valve-tube *a* is placed at a different angle with the hydraulic main from that which the bridge-pipe B makes with it, as shown in Fig. 3.

The operation is obvious from the construction.

Before drawing the charge from the retort the valve V is closed, and communication between the retort and the main thus shut off. When the retort has been charged and its mouth closed up, the valve V is opened, and the gas makes and flows, through unobstructed pipes, into the hydraulic main.

By dispensing with the dip-pipes the gas-holding capacity of the hydraulic main is very greatly increased, as nearly all the liquid contents may be drawn off, leaving almost the entire capacity of the main for the reception of gas before it is conducted off to be purified.

By running the retort without pressure, moreover, the accumulation of fixed carbon in the retort is much retarded, and the durability of the retort correspondingly increased. It is also found that a much larger percentage of gas is produced from a given quantity of coal by this method. The results which I have obtained place this gain as high as twenty per cent. Thus, by a simplification of the apparatus, a double economy is effected—a lessening of the wear and tear, and an increase of the product. This I deem a valuable improvement in the art of gas manufacture.

I am aware that it has been proposed, in the patent of George A. McIlhenny, dated June 18, 1867, to unseal the dip-pipes by lowering the water in the hydraulic main, and to seal them again by raising the water in the main. Such a method, if practicable, is complicated,

expensive, and troublesome, and differs totally from that which I have devised.

The valve I have described may be introduced at any convenient point between the gas-producing material in the retort and the liquid contents of the main. I have, in fact, located the valve within the mouth-piece of the retort, and also within the hydraulic main, with equally satisfactory results, so far as the principal object of the invention is concerned. Various forms of valve might be employed, and more than one might be used without in either case affecting the principle of the invention. I do not, therefore, confine myself to any particular form or number of valves or cut-offs, or to any specific location of them.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent as an improvement in the art of gas manufacture, is—

A gas apparatus in which dip-pipes are dispensed with, and the retorts operated without pressure by the introduction of one or more valves or cut-offs at any convenient point between the gas producing material in the retort and the liquid contents of the hydraulic main, substantially in the manner and for the purposes set forth.

The above specification of my said invention signed and witnessed at Cambridge this 11th day of August, A. D. 1869.

WILLIAM GIBSON.

Witnesses:

FREDERICK T. STEVENS,
K. S. CHEEFER.