

BOWER, GEORGE—*continued.*

which is costless, will produce an illuminating gas when decomposed, and its hydrogen liberated and carbonised, but the cost of decomposition for the production of hydrogen—one only of the elements of which it is composed—is actually greater than that of highly illuminating gas produced from coal; and notwithstanding the many attempts to supersede it, it may be emphatically stated, that nothing whatever can in any commercial sense compete with coal, even giving it a range of price far beyond what it is at present.

Having established this fact, it became necessary to devise a cheap, simple, and economical apparatus, and the result has been the exhibitor's inventions, patented in 1852, 1859, and 1860; the last of which (the vertical retort), in connection with the combined purifying apparatus, has been pronounced far superior to all others, in every essential property requisite for the manufacture of gas on a small scale.

These features may be noted in the articles exhibited, viz., the vertical retort or gas generator, with its appurtenances, and the combined hydraulic main, condenser, and purifier, being equal in their conjoint capacity to a power representing about twenty lights. (The gasholder cannot be exhibited, for want of space.)

The gas generator consists of a conical retort, set vertically in an iron case, lined with fire-brick; both ends of such retort are open, the top being surmounted by a hopper, for the purpose of charging it with coal, to be afterwards closed by a luted plug, and the bottom provided with a luted door, having a false bottom or diaphragm projecting about six inches into the retort. This door, when closed, is retained in its position by means of a lever, having a swing catch and wedge; the fire-grate being arranged around the retort, so as to bring the fire itself into immediate contact with its outer surface. The mode of operation is, to heat the retort to a bright red, the bottom door being then luted, and raised to its proper position by means of the lever and catch; the retort is next filled, by the use of the hopper, with the necessary charge of dry coal or cannel, and the top closed with the luted plug. After the lapse of three or four hours, the gas will be extracted, the wedge and catch may be removed, and the door lowered by the lever to the pair of horizontal bars; and being removed, the

coke falls out leaving the retort free for renewed operations.

The combined purifying apparatus consists of the hydraulic main, condenser, and purifier, united in one vessel or case, the base of which forms the hydraulic main; and a receptacle for the products, separated from the gas by the condenser, which condenser is so formed that the gas passes around the purifying vessel, in a space, the inner surfaces whereof are exposed to the water, forming the lute or seal for the purifying lid; and the outer surfaces are exposed to the atmosphere.

The purifier is provided with a cover, and four tiers of shelves, or perforated plates, which, when in operation, are covered with lime, and through which the gas percolates.

The gas is brought from the retort by means of a pipe into the hydraulic main, thence passing up and down the spaces forming the condenser, into the purifier, and from thence it is conveyed into the gasholder, ready for use.

The principal advantages of these arrangements for private works on a small scale are:—

1. They occupy but little space, are very simple, and require but little labour or skill to manage.

2. No bricks are required to set the retort, further than the few sent with the apparatus, and these are moulded of suitable shapes.

3. The retort being set vertically, and surrounded by fire, in immediate contact with it, requires less fuel than if set horizontally, and the fire may be lighted and permitted to go out with impunity, the same as an ordinary shop or hall stove.

4. It is adapted for common coal as well as cannel, and may also be adapted for the generation of gas from wood, peat, or oil, in situations where coal is difficult to be obtained.

5. In this arrangement of retort, by merely removing the top and bottom covers, when red-hot, the current of air that passes through, will remove all deposits of carbon from the interior.

6. The whole of the apparatus for removing impurities from the gas by condensation and purification, which by the ordinary process consists of three or four separate and cumbrous vessels, is effectually combined in the limits of one solid base.

7. The retort, when worn out, can be replaced, without requiring a skilled workman to fix it.

[2233]

BALE, T. S., *Mount Pleasant, Newcastle, Staffordshire.*—Mosaic and ornamental floor, wall tiles, and glazed bricks.

[2234]

BARNETT, S., *23 Forston Street, Hoxton.*—Diving apparatus.

[2235]

BARRETT, HENRY, *12 York Buildings, Adelphi.*—Model of fireproof flooring.

[2236]

BASFORD, WILLIAM, *Elgreave Street, Burslem.*—Front-facing brick, in connection with walls or fronts of cottages, and other buildings; roof and floor tiles, &c.

[2237]

BEART'S PATENT BRICK COMPANY, *Arsley, and King's Cross, London.*—Bricks and agricultural drain pipes.

[2238]

BELLMAN & IVEY, *14 Buckingham Street, Fitzroy Square, W.*—Specimens of various imitations of scagliola marble.

[2239]

BETHELL, JOHN, *38 King William Street, London, E. C.*—Specimens of creosoted woods.