Specification of Alfred Vincent Newton : carbonization of coal, &c.;

A.D. 1851 . . . . . N° 13,642

SPECIFICATION

OF

ALFRED VINCENT NEWTON.

CARBONIZATION OF COAL, &c.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:
PUBLISHED AT THE GREAT SEAL PATENT OFFICE,
25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 2s. 3d.

1857.

A.D. 1851 . . . . . N° 13,642.

Carbonization of Coal, &c.

NEWTON'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ALFRED VINCENT NEWTON, of the Office for Patents, 66, Chancery Lane, in the County of Middlesex, Mechanical Draughtsman, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Royal Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-seventh day of May, in the fourteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Alfred Vincent Newton, Her especial license, full power, sole privilege and authority, that I, the said Alfred Vincent Newton, my exors, admors, and assigns, and such others as I, the said Alfred Vincent Newton, my exors, admors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein mentioned, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, an Invention of "IMPROVEMENTS IN THE CARBONIZATION OF COAL, AND IN THE UTILIZATION OF THE PRODUCTS DISENGAGED DURING THAT OPERATION IN IMPROVING THE QUALITY OF THE PRODUCTS INTENDED FOR ILLUMINATING PURPOSES, AND IN REGULATING THE FLOW OF THE SAME," being a communication from abroad; in which said Letters Patent is contained a proviso obliging me, the said Alfred Vincent Newton, by an instrument in writing under my hand and seal, particularly to describe and ascertain the nature of the said Invention, and in what manner the same is to be per-

formed, and to cause the same to be enrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Alfred Vincent Newton, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, is particularly described and ascertained in and by the following description thereof, reference being had to the Drawings hereunto annexed, and to the letters and figures marked thereon (that is to say):—

When coal is operated upon in gas works by the ordinary methods for obtaining gas for illumination, the coke produced is not suitable for smelting ores, and for the generation of steam in locomotives. There are, however, plans by means of which coke adapted for use in locomotives and gas suitable for illuminating purposes can be produced simultaneously by the distillation of coal; but these plans do not in every respect satisfactorily effect their intended object, for if the cooling of the coke is effected in the distilling chamber, as is sometimes the case, a loss of time and of caloric ensues; whereas, on the contrary, if the coke be extracted from the retort or distilling vessel in a state of incandescence it will undergo a certain change by being brought into sudden contact with air and water, whereby it will be rendered brittle, and considerable loss will ensue therefrom. According to the methods at present in use for charging the apparatus with coal and extracting the coke, a great expenditure of time is required, and a considerable decrease in the temperature ensues. The result of thus recommencing the distillation of every fresh charge at a low temperature will be to produce gas of an inferior quality to that which would be obtained if the extraction of the coke were effected without allowing the apparatus to cool, and the process of distillation were commenced at a high temperature. Moreover, no apparatus now in use admits of a sufficient mass of coal being operated upon at one time, to give the necessary density to the coke.

The improved apparatus and processes forming the subject of the present Invention are intended to overcome these disadvantages.

The objects of the present Invention are, first, to extract gas from coal, and at the same operation to produce a quality of coke suitable for smelting metals and generating steam in locomotives, and also to prevent, to a certain extent, the formation of bituminous oils during the process of distillation, and by that means to increase the illuminating power of the gas produced;

second, to regulate the flow of gas in pipes laid underground, or to supply gas to the consumer at a more equable pressure.

I will only describe two arrangements of apparatus for carrying out the first part of this Invention, but desire it to be understood that I do not confine myself thereto, as various modifications and analogous arrangements may be employed without departing from the nature and object of this Invention.

The first apparatus is represented in Figs. 1, 2, 3, and 4, Sheet I. of the accompanying Drawings. It may be made to work either with or without an extractor, according to whether it be desired to collect the gas for illuminating purposes, or to employ it as fuel in the carbonization of the coal. The distinctive characteristics of this apparatus are to allow of the coal being operated upon, and the coke discharged in large masses to cool the coke without the contact either of air or water to work continuously, that is, without stopping to discharge and recharge the apparatus, the discharge of the coke being nearly simultaneous with the introduction of a fresh charge of coke, to obtain gas per-carburetted, or to a greater degree than is ordinarily produced, the apparatus being maintained at a higher temperature by reason of the simultaneous charging and discharging to apply a portion of the gas as fuel to effect the distillation of the coal, and lastly, to cause the caloric to circulate in such a manner as to utilize it as completely as possible.

The conditions necessary for obtaining these results are, first, that there should be two chambers placed contiguous to each other, in such manner that the first chamber may easily discharge its contents into the second almost instantaneously in a lamp, and without the necessity of employing the manual labor required in the present apparatus; second, that the caloric be caused to circulate by means of a peculiar arrangement of channels or flues.

This apparatus is constructed of brickwork and cast and wrought iron or other suitable metals, and is provided with one or more fire-places or furnaces. By means of a suitable arrangement of registers, the products of combustion of one or more fire-places may, before proceeding to the chimney, be conducted successively or simultaneously to any number of apparatus. In that case each fire-place need only furnish its own quantity of heat. Near the fire-place or fire-places is placed the chamber in which the distillation of the coal is effected, and which is therefore called the distilling chamber. It is represented in the Drawing as constructed of brickwork, and has an opening at top for the reception of the charge. This chamber is surrounded by flues for the circulation of caloric, and is curved longitudinally to the

degree necessary for the reception of the charge of coal, and its discharge when converted into coke. This curve must have the same radius at all points, in order that the mass of coke may be discharged freely without injury. This curve is so placed as to have a greater inclination at its upper than at its lower part, and this inclination might even assume a vertical position. The same holds good with the second chamber, which will be described under the name of the cooling chamber. It is situated at the lower extremity of the distilling chamber, and is intended to receive the coke therefrom and cool it. These two chambers are made to communicate by means of doors or covers which are opened and closed by means of a crane or any other suitable mechanical contrivance. The cooling chamber is constructed of masonry. It is supplied with air by means of flues outside, and has a door at its lower extremity through which the coke is extracted.

In Figures 1, 2, and 3, of Sheet I, A represents the fire-place furnished with a door A^1; B is the ash pan; C, the distilling chamber; D, the upper opening of distilling chamber furnished with a cover D^1, which turns on a hinge D^2, and is worked by a chain D^3; E is the lower opening of the distilling chamber, furnished with a stopper E^1; F is the cooling chamber; G, the upper orifice of the cooling chamber furnished with a cover G^1; G^2 is a frame mounted on the inclined plane and furnished with a trap G^3; H is the lower opening of the cooling chamber, and is furnished with a moveable cover for the extraction of the coke; I is the dome or top of the furnace; I^1, dome for the distribution of caloric; I^2, flues for the circulation of caloric; I^3, flues for the escape of the caloric and incombustible vapours; J is a horizontal flue, and K, K, are channels for ventilating the cooling chamber; L is the chimney for the extraction of the gas, and is provided with a cover L^1; L^2, L^2, are pipes for the extraction of the gas; L^3, L^3, are covers to the apertures for cleansing the same; M is a plunger working in the hydraulic main N, and forming an hydraulic joint; O is a chimney for conducting the gas to the fire-place or direct to the chimney J, and having a cover O^1; P is a communicating pipe between the chimnies L and O; Q, the upper railway on which runs a tilt waggon Q^1; Q^2, the lower railway on which runs a moveable crane Q^3, having a counterweight Q^4, and worked by chains Q^5, for the purpose of opening and closing the apertures E and G by raising or lowering the covers E^1, G^1.

The whole apparatus is constructed upon an inclined plane, the distilling chamber G being set upon a curve, its degree of inclination increasing to the top. This chamber is heated by means of the fireplace A and flues I^2; it has

also an orifice D at its upper part (which is furnished with a cover D^1) for the reception of the charge of coal with which it is fed by means of the tilt waggon Q^1 that runs upon the railway Q.

Before feeding in the coal the lower opening E is closed by the cover E^1. The gaseous products pass off through the chimney L and the pipes L^2 to the hydraulic main N; this latter may if found convenient be situated at any other suitable part of the apparatus.

The cooling chamber F (Fig. 1), is situated at the lower extremity of the distilling chamber. It is furnished with the external ventilating flues K, K. The upper opening G of this chamber is provided with a cover 2^1, and its lower orifice H with a cover H^1. When the coal contained in the distilling chamber has been converted into coke, the incandescent mass is transferred entire to the cooling chamber F. For this purpose the lower cover E^1 of the distilling chamber and the upper cover G^1 of the cooling chamber are simultaneously removed by means of the draw chains Q^5 connected with the moveable crane Q^3, and the mass descends by its own weight from one chamber to the other; the covers are then replaced and properly luted. In order to facilitate this latter operation, the inclined bed G^3 between the two covers is lowered, and this space thus remains open until the luting is removed. When several apparatus are set up contiguous to each other, the products of combustion may be caused to pass from one to the other through the flues I^3. The gases not suited for illuminating purposes may, after each operation, be conducted to the furnace A through the flues P; should it not be required to use any of the gases for illumination, they may be employed as fuel to aid in the carbonization of the coal. In this case the apparatus for extracting the illuminating gas is not employed, and the whole of the gas is treated as has been above described for the combustion of a portion. The air necessary for the combustion of the gas is introduced through flues adapted for that purpose, and in this case the fire-place A is made smaller, as it is fed only with refuse fuel.

It is scarcely necessary to observe that the distilling chamber may be constructed of metal or in several parts of fire clay, and that it may be worked either with or without an extractor.

It is necessary when charging or discharging the distilling chamber to shut it off from the action of the extractor, in order to avoid any admixture of air with the gas. This is effected by means of the apparatus represented in Fig. 4 (Sheet I.). N is an hydraulic main, R is a pipe for the entrance of the gas, S is a cylinder in which the plunger M works, its lower end being

made to dip into the water in the hydraulic main, and thus form a water joint; S^1 are pipes concentric with the plunger. The plunger is affixed to arms S^2 connected to the rod S^3, which rod works in the stuffing box S^4 and through guides S^5; it is provided with stop pieces S^6, by which its length of stroke may be determined. The working of this hydraulic key will be understood from the above description; it is scarcely necessary to observe that in order to arrest the flow of the gas, it is only requisite to lower the plunger into the liquid.

This apparatus may also be applied to an extractor as an hydraulic valve.

The second arrangement of apparatus is represented in Sheet II. of the Drawings, at Figures 1, 2, and 3. The principal points of dissimilarity between this arrangement and that represented in Sheet I. are, first, that the cooling chamber is dispensed with; secondly, there is a difference in the form, arrangement, and nature of the materials constituting the distilling apparatus; and, thirdly, the gas is obtained without the help of an extractor.

In this arrangement also the distilling chamber is curved, and the gaseous products of distillation pass off by the pipe I. A is the fireplace, having a door A^1; B, the ash-pit; C, a curved retort constructed either of cast iron or clay; D, the upper or feed opening, having a cover D^1; E, the lower or discharge opening, having a cover E^1, which may either be hinged or made to slide up and down; F are flues for the circulation of caloric; G, exit flues for caloric; H, horizontal flue; I, pipe for the extraction of the gas; J, plunger rod; K, plunger; L, hydraulic main; M, railway; M^1, tilt waggon.

The second part of the Invention relates to a means of regulating the flow of gas, and may be adapted either to pipes running underground or at the houses of consumers.

The regulator to be applied to service mains or pipes running underground consists, firstly, of a valve whereby the section of the aperture for the flow of the gas may be determined or regulated; secondly, a float for giving motion to the mechanism, and which is operated by the action of the gas; thirdly, a counter-weight for regulating the minimum degree of pressure under the influence of which the gas is to flow; fourthly, a second weight for determining or regulating the pressure of the gas; and, fifthly, a metal casing enclosing the whole, so as to form one piece with the pipe. This regulator is represented in Sheet III. of the accompanying Drawings, at Figures 4, 5, 6, and 7. A is the entrance pipe for the gas; B, exit pipe for the same; C, the cover; D, the casing for the valve; D^1, D^1, guide pieces; E, the float or bell suspended from the beam F by a flexible rod G; H, the regulating valve mounted on a

valve rod I, and having a connecting rod I^1; J, J, pipes leading to the atmosphere; K, a water tank; L, bearing for the beam; L^1, rod mounted upon the beam at a given angle; M, chamber occupied by gas; N, minimum counterweight; N^1, progressive counterweight or weight for regulating at will the pressure of the gas; O, rod of minimum counterweight; P (Fig. 5), cock. Q, Q, circular pipe; S, cheeks of the case D.

The valve H is composed of four parts; first, the valve properly so called; it is made by preference of a rectangular form, and is mounted so as to turn very freely; second, the casing D in which it works, having two cheeks S, S^1, which enter the pipe A and chamber M. The valve in its movement is always in contact with the cheeks S; third, the two guide pieces D^1, D^1, fixed above and below in opposite directions. A small hole is made in the lower one to allow the waters of condensation to run off.

The float consists of a bell E. The metal tank K is circular, and has a chamber at one of its sides; the large circular portion is for the reception of the bell E, and the small chamber receives the minimum counterweight N; this tank and its chamber are partially filled with water. On the sides of the tank are formed two tubes, which lead to the pipes A and B, and to its flanged top is fastened the cover C. The pipe J, J, is for the passage of air between the level of the water and the top of the bell. In order to avoid any sudden action of the valve, air can only pass into and out of the bell E through the pipe J, J, the opening of which is only of a certain size. The pipe J, J, is divided below into two branches; the first leads to the surface of the ground, and is provided with a cock which communicates with a manometer, and thereby allows the conditions under which the float is working to be ascertained. Near this manometer, at one side of the tube leading thereto, is an orifice for the passage of the air necessary for the play of the float. Through this orifice air may also be introduced by means of a blower under the bell in quantity proportioned to its capacity, and the orifice being plugged up the float will resist any pressure in the chamber M, and the gas will continue to circulate as if the apparatus were not in existence. By this means the power is reserved of neutralizing eventually the action of the compensator upon the gas in the pipes without in any way disturbing the surface of the ground. The office of the second branch J, which is underground, is to allow any water to run off which might accumulate in the pipe J, J; it terminates either in a syphon or a cock P. In the latter case the cock is surmounted by a vertical pipe, the orifice of which is on a level with the surface of the ground, and by means of which the cock may by a rod be opened or closed at pleasure. It is indispensable to shut

this cock when it is desired, by the introduction of air as above described to prevent the gas from acting on the float.

At the side of the manometric cock are two other cocks communicating with the gas pipe by means of small tubes, one placed before and the other behind the compensator, and put into communication with the monometer in order to ascertain the pressure of the gas before and behind the valve of the compensator. These three cocks, as well as the manometer, are contained in a casing situated near the apparatus. On a level with the pipes A, B, (Figures 4, 5, 6, 7,) is a circular channel Q, Q, for the passage of the gas, when the capacity of the chamber M is lessened by the ascent of the bell. The counterweight N is composed of discs of metal mounted upon the rod O, each being of a certain weight corresponding to a given degree of pressure. The rod O extends below, so as to allow the counterweight to act completely below the level of the lowest part of the pipe A, and so that the bottom of the chamber stopping its progress shall arrest the ascent of the bell E.

The beam F is attached at one end to the bell E, and at the other end to the rod O of the counterweight, by flexible steel rods G, G.

The apparatus thus constituted gives out the gas at a determinate pressure, but this pressure becomes modified on passing through the pipes, in proportion to their size and the speed at which the gas is flowing, which varies according to the consumption. The apparatus should therefore, in order to perform effectually, give out the gas at a pressure proportioned to the consumption, and at progressive degrees in a ratio corresponding to the speed at which the gas is flowing. This result is obtained by means of what the Inventor denominates the progressive weight N^1, which is mounted upon the rod L^1 (Fig. 1), and admits of the increase of pressure under which the gas is to flow to be determined at pleasure. The effect of this arrangement is to increase the action of the minimum counterweight N^1 in proportion to the inclination of the beam, the play of which displaces the centre of gravity of the progressive counterweight N^1.

The general casing (see Fig. 1) is composed of the parts above described (viz^t), the tank K with its circular channel Q, Q, the valve case D, and the cover C. This cover possesses sufficient internal capacity to allow of the play of the beam, and is provided internally with ribs to enable it to resist the pressure of the ground, and thus to ensure the safety of the apparatus. The pipe A is under the influence of unregulated pressure. The valve H determines according to its position the section of the aperture for the flow of the

gas. The internal space M behind the valve contains the gas, the pressure of which is regulated, and which flows out through the pipe B. The degree of pressure under which the gas is required to flow is regulated by the ascent of the bell float E, and this ascent is determined by the action of the counter-weights fixed to the beam F, the bell E being put in communication with the atmosphere by the tube J, J.

In the position of the bell float, shewn in the Drawing, it is supposed that the pressure of the gas contained in the space M, M, is greater than the tendency of the float to rise. In this position the valve H acts against the entrance of the gas until that contained in the space M, M, undergoes a diminution of pressure which allows the float to ascend and open the valve to the required extent. In fact, if the pressure of the gas increases in the space M, M, the float by descending moderates by the play of the valve the entrance of the gas; if, on the contrary, the pressure of the gas tends to diminish the float by ascending allows of the entrance of more gas at progressive degrees of pressure according to the rate at which it is flowing out. It is evident that by this means a pressure is obtained, regulated according to the rate at which the gas flows out, occasioned by a greater or less consumption. The gas does not enter the inside of the bell float E, which is by means of a pipe in communication with the external atmosphere; the gas in its passage through the apparatus does not undergo any change of direction, nor does the apparatus require to be of large dimensions. The water of condensation which may be in the pipes underground will occasion no inconvenience; on the contrary, it serves to replenish the tank K, containing the float. To conclude, the apparatus cannot be injured by damp, as all the parts are saturated with gas.

A form of regulator more especially intended for the use of consumers is represented at Figures 1, 2, and 3, in Sheet III. A is the entrance pipe for the gas; B, the exit pipe for the same; C, the cover; D, a horizontal partition; E, the bell or float; F, the beam; F^1, a segmental arm of the same; F^2, a steel suspension rod; F^3, the other end of the beam furnished with a counterweight F^4; G, a vertical or inclined rod, provided with a progressive counterweight G^1; H is the valve; I, in Fig. 1, is a horizontal shaft, having a fork I^1, and having at its centre a spindle I^2, and working in a stuffing box I^3; I^4, crank attached to the shaft I; I^5, stop piece; J, atmospheric pipe; J^1 waste pipe; K, first lower receiver; K^1, second receiver; L, support for the beam; M, third receiver; P (Fig. 3), stopper to opening for drawing off water; R, air tube; S, stop piece for the beam; T (Fig. 3), feed opening. In this arrangement,

the lower part K of the apparatus is a receiver, fed by the pipe J, for the products of condensation, and also for receiving any superfluous waterwh ich may be contained in the capacity K^1, by the syphon pipe J^1. At the lower part of this receiver K is a screw plug. P, Fig. 3, for drawing off the water. The opening R is furnished with a pipe called a safety pipe communicating with the outside of the house. Its object is to allow the introduction or expulsion of air in the bell float E, according to its upward or downward movement. The object of this pipe is also in case there should be a lack of water in the apparatus, and consequently danger of gas entering the pipe J, to carry it off from the dwelling, and by that means avoid any danger.

It will be seen, on referring to the Drawings, that the tank or capacity K^1 is filled with water as high as the upper orifice of the pipe J^1, by means of the supply pipe T, Fig. 3. The gas escapes from the apparatus through the pipe B. D is a partition having an opening in which the valve H works, and at the lower part of this valve, the bell or float E is attached. Above this partition is another chamber M with a pipe A for the entrance of gas; this chamber is closed by the cover C, and contains the remaining mechanism of the instrument, which is composed of the support L for the beam F, at one end of which is attached the steel suspension rod F^2 supporting the valve H and the float E; at the other end F^3 of the beam is a weight F^4, intended to form an equilibrium to the different parts attached thereto, and also to determine the minimum pressure under the influence of which the gas is compressed in the chamber K^1.

Upon the shaft of the beam is mounted a rod G, set at any required angle, and provided with a counterweight G^1. This counterweight is intended, according to the position of the beam, to increase or diminish the value of the weight F^4, and to modify the progressive pressure under the influence of which the gas is required to flow.

From the above description it will be understood that the fixed and minimum or progressive degree of pressure may be obtained within any desired limits by bringing either of the weights nearer to or further from the shaft of the beam or other analogous part. For this purpose the weights are made adjustable either on the end of the beam or on the rod G; or the same result may be obtained with a single weight by adjusting it in such a manner that its movement shall displace it from its centre of gravity.

In the example above given, it will be observed that the beam in its longitudinal extent describes an angle, which may be infinitely varied and produce the same result; this is the same also with regard to the position of the rod G, as

respects the beam, as the means indicated consists in changing, by the play of the beam, the centre of gravity of the counterweight or counterweights G^1 and F^4. The piece S is intended to limit the course of the beam F, by adapting thereto two stop rods. I is a small shaft passing to the outside of the apparatus through the stuffing box I^3, and worked by the crank I^4. In the middle of this shaft is a fork I^1, which is capable of being brought into contact with the spindle I^{11} affixed to the beam. The object of this arrangement is by the rotatory movement of the shaft to raise by the action of the fork I^1 and the spindle I^{11} that end of the beam, and with it the valve, and allow the free passage of the gas.

It will be understood from the above description and Drawings that the gas enters the upper chamber M through the pipe A, from thence it passes through by the valve way to the chamber K^1, whence it makes its escape through the pipe B. The opening of the valve is dependant upon the movement of the beam, and the influence of the counterweight or counterweights, the action of which is to raise the float E, and consequently the gas contained in the chamber K^1 is submitted to a given pressure, under which it flows out. Should this pressure tend to diminish, the float will by rising open the valve and allow an increased quantity of gas to pass. If, on the contrary, the consumption of the gas is less than the supply through the valves H, the pressure, by increasing above the float, will cause the valve to descend and diminish the area of the exit aperture for the passage of the gas.

It will also be understood that the greater the extent to which the valve is open the greater will be the pressure of the gas above the float, as the beam by its movement increases the relative power of the counterweight or counterweights, by displacing the centre of gravity of these latter, which arrangement allows of the application of progressive pressure to the flow of gas.

Having now described this Invention, and the best means with which I am acquainted for carrying the same into effect, I desire it to be understood that I do not intend to confine myself rigidly to the details above given, as they may be variously modified without departing from the nature of the Invention. I would also observe that although, in order that the various improvements of which the present Invention consists may be more clearly understood, I have thought it necessary to explain in detail various parts which may have been before known and in use, yet I do not by any means intend to claim them as forming part of the present Invention, except when they are combined and arranged in the manner herein-before set forth; but that which I consider to be new, and therefore desire to claim as the Invention secured to me under the

above in part recited Letters Patent, is, as regards the apparatus represented in Sheets I. and II. of the accompanying Drawings.

First, the arrangement of the distilling chamber or coke oven with or without the stationary cooling chamber, in combination with the furnace or furnaces and flues or channels for the distribution and transmission of caloric from one apparatus to the other.

Second, I claim constructing upon a curve the chamber in which the operation of distillation or carbonization is effected, which curved chamber is placed at the degree of inclination most favorable to the feeding in of the coal and discharging of the coke.

Third, I claim placing or arranging the cooling chamber in such a manner that it may form a continuation of the distilling chamber.

Fourth, the mechanical arrangements and apparatus by means of which the coal is fed into the distilling chamber, together with the other arrangements by means of which the distilling and cooling chambers are put in communication in order to allow the charge to pass from one chamber to the other when the coal has been converted into coke.

Fifth, the general arrangement of the apparatus which enables the coal to be operated upon in such manner as to obtain coke of greater density than at present.

Sixth, the railway and moveable crane placed upon the inclined plane for the purpose of working the moveable covers of the distilling and cooling chambers.

Seventh, the arrangement by means of which the gas may be collected for illuminating purposes or wholly or partially applied to heating purposes.

With regard to the regulator represented in Sheet III., I claim the peculiar construction and arrangement of the same for the purpose of regulating the flow and distribution of the gas to consumers, as above shewn and described.

And I claim particularly the use of the arm G and progressive weight G^1 in Fig. 1, and the arm and weight L^1 and N^1 in Fig. 4.

In witness whereof, I, the said Alfred Vincent Newton, have hereunto set my hand and seal, this Twenty-seventh day of November, in the year of our Lord One thousand eight hundred and fifty-one.

(L.S.) A. V. NEWTON.

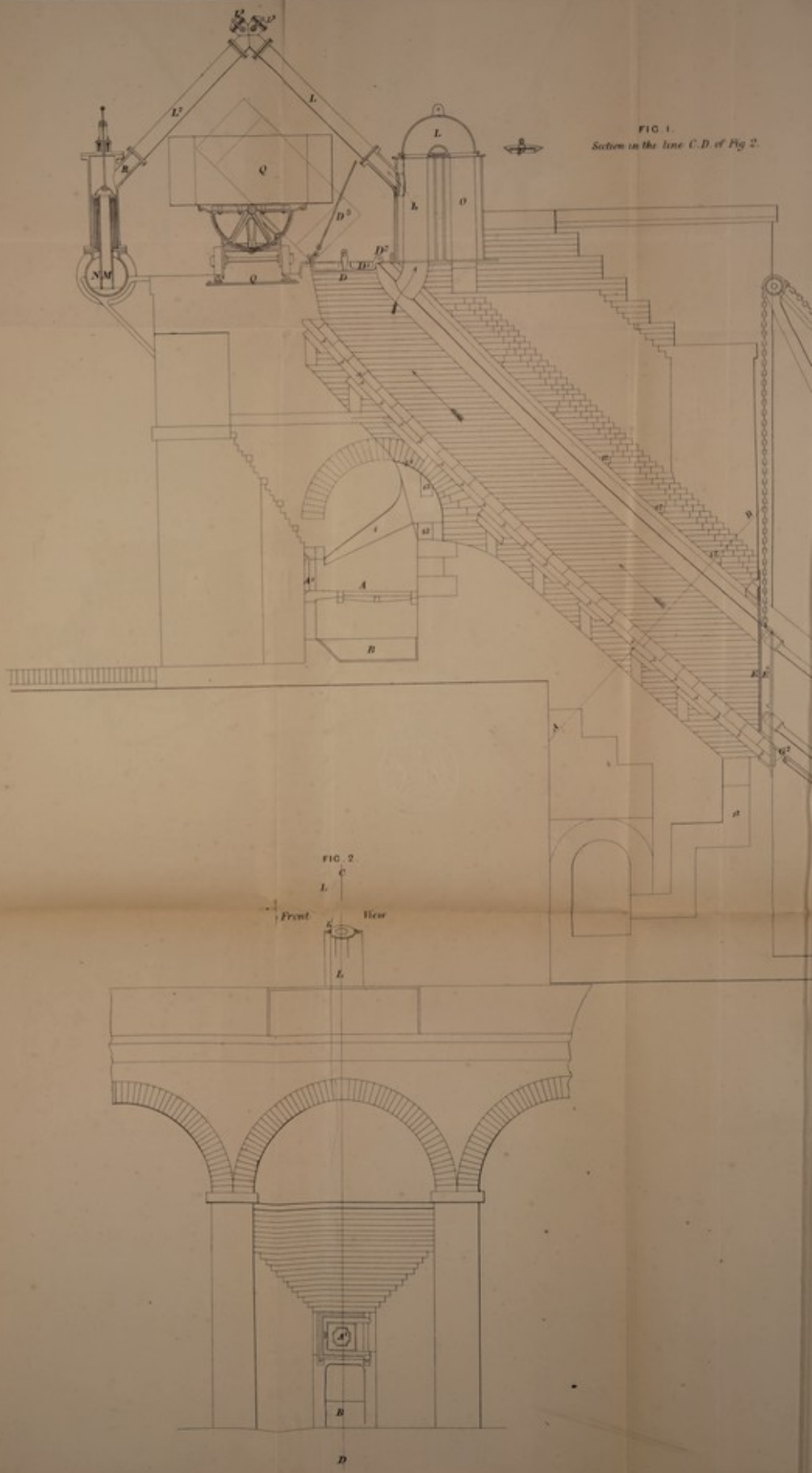
AND BE IT REMEMBERED, that on the Twenty-seventh day of November, in the year of our Lord 1851, the aforesaid Alfred Vincent Newton came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

BERREY.

Enrolled the Twenty-seventh day of November, in the year of our Lord One thousand eight hundred and fifty-one.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1857.

A.D. 1851. May 27. N°13,642.
NEWTON'S SPECIFICATION.



The enrolled drawing is partly colored.

London: Printed by George Edward Eyre and William
Printers to the Queen's most Excellent Majesty

FIG. 1.
the line C.D. of Fig 2.

FIG. 4

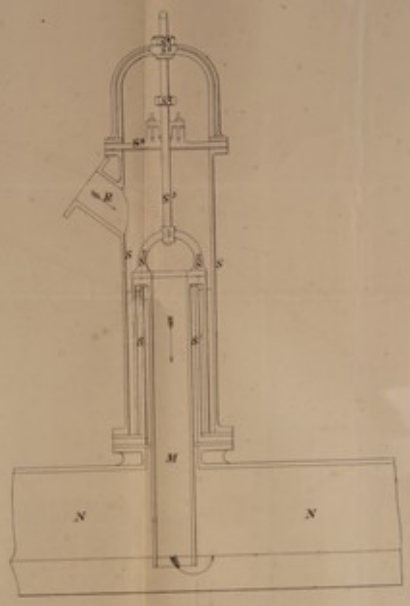


FIG. 3
Section on the line A.B of Fig 1.

Drawn on Stone by Malby & Sons

London: Printed by George Edward Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1857.

FIG. 1.

Section in the line A B of Fig. 3.

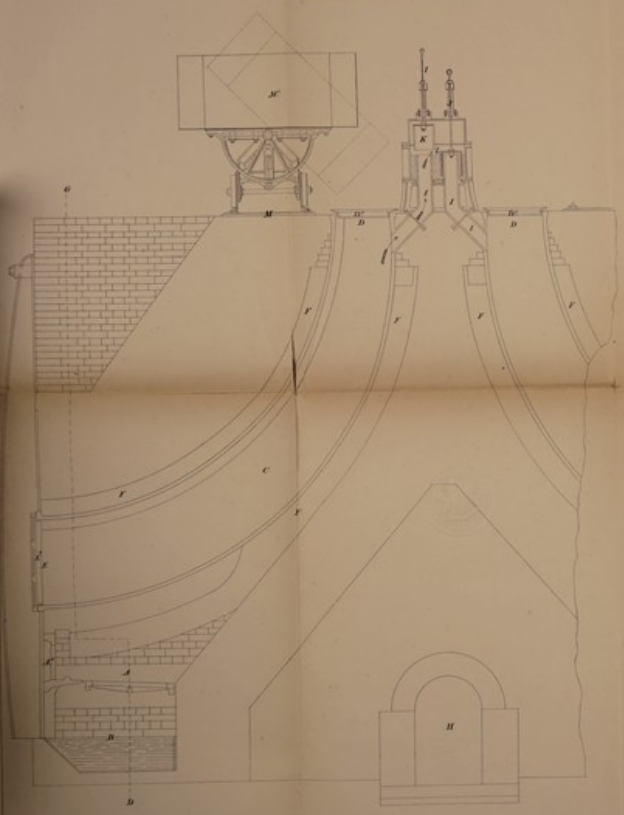


FIG. 2.

Section in the line C, D of Fig. 1.

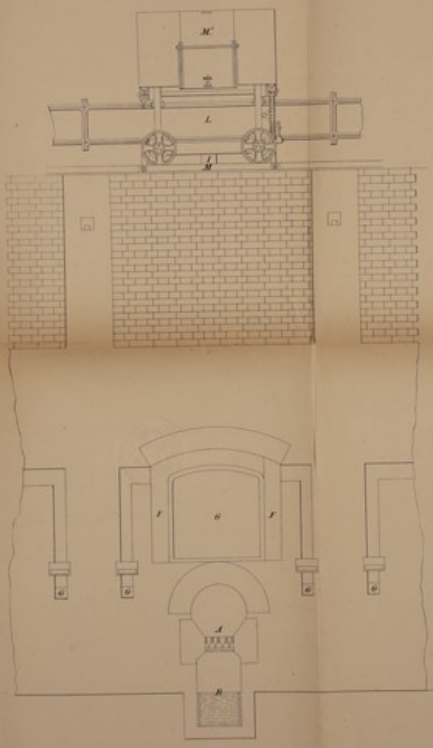
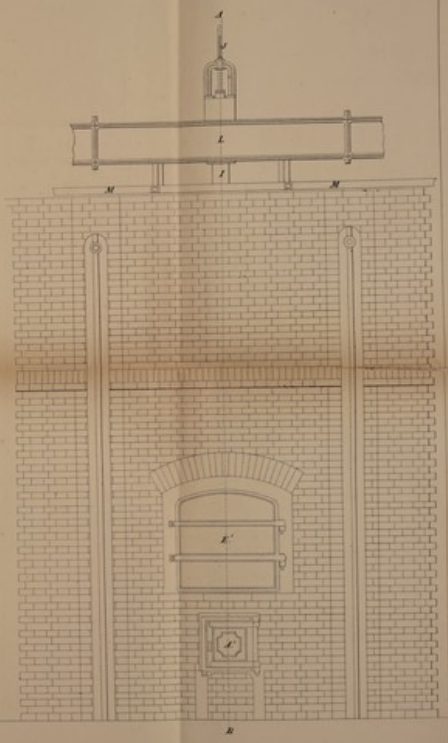


FIG. 3.

Front View.



The smallest drawing is partly altered.

London: Printed by George Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1852.

FIG. 4.
Section in the Line a, b of Fig. 7.

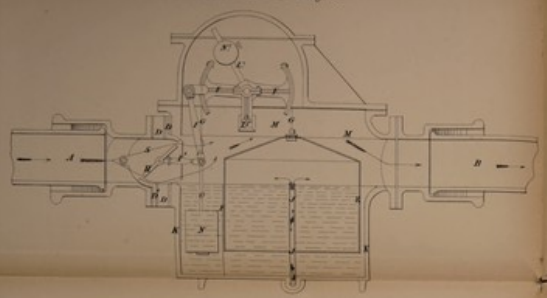


FIG. 5.
Elevation.

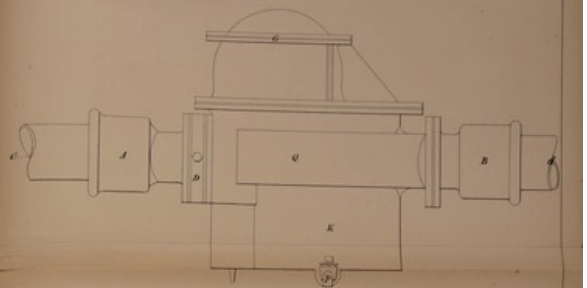


FIG. 6.
Section on the line c d of Fig. 4.

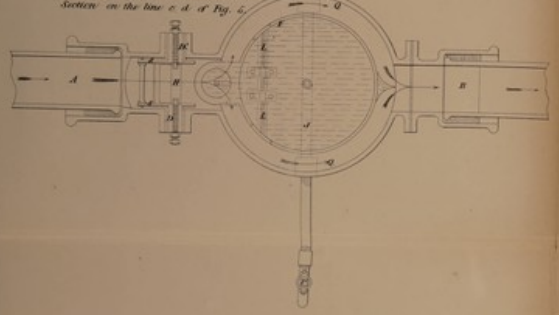


FIG. 7.
Plan View

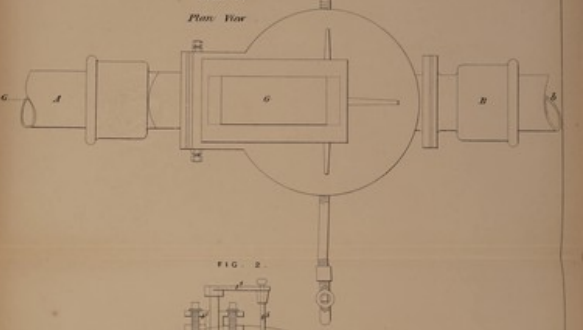


FIG. 1.

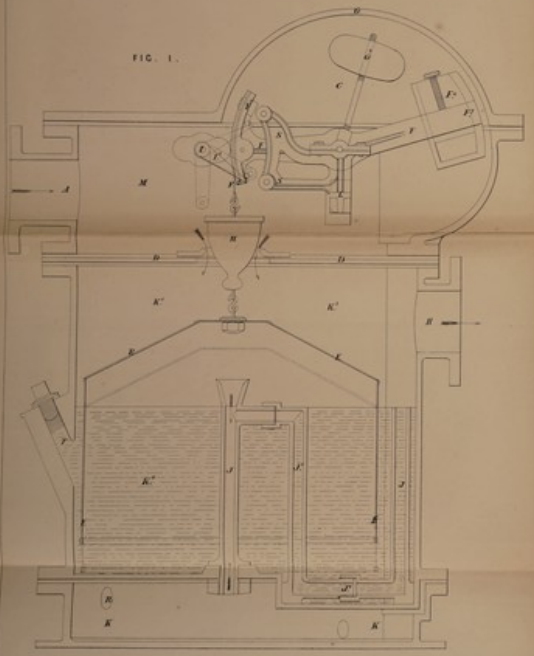


FIG. 2.

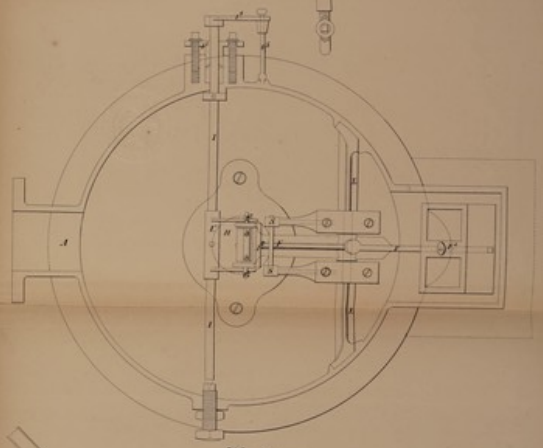
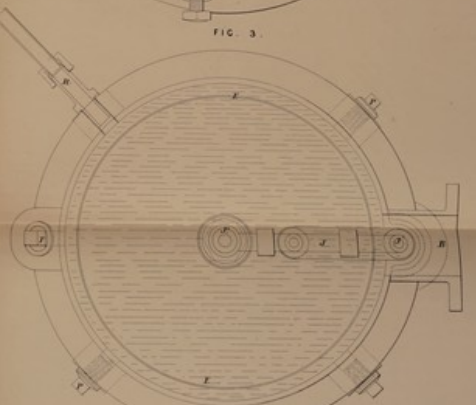


FIG. 3.



The enrolled drawing is partly coloured.

Printed by George Edward Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1853.