J. CHASE.

Carbureter.

No. 50,987. Patented Nov. 14, 1865.

Fig. 2.

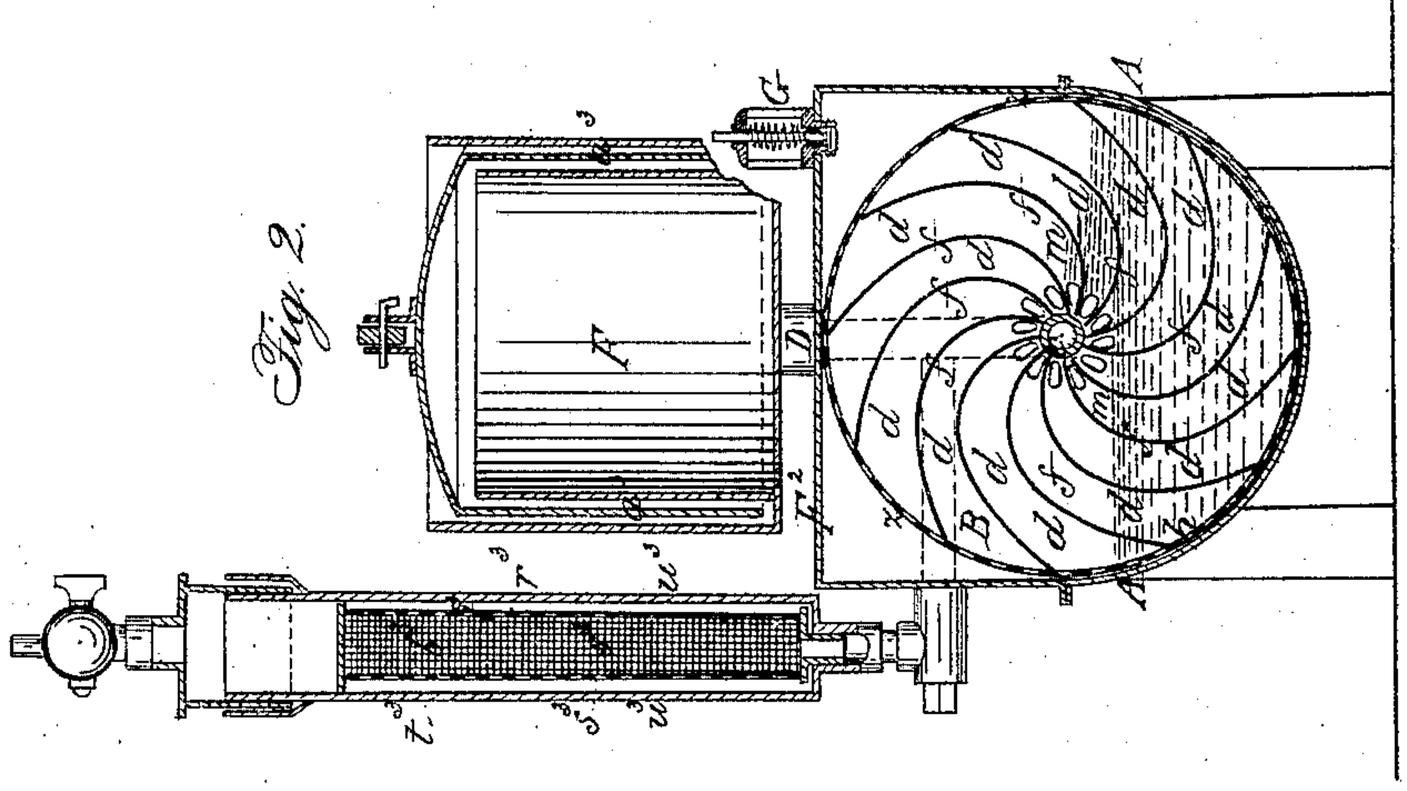


Fig. 1.

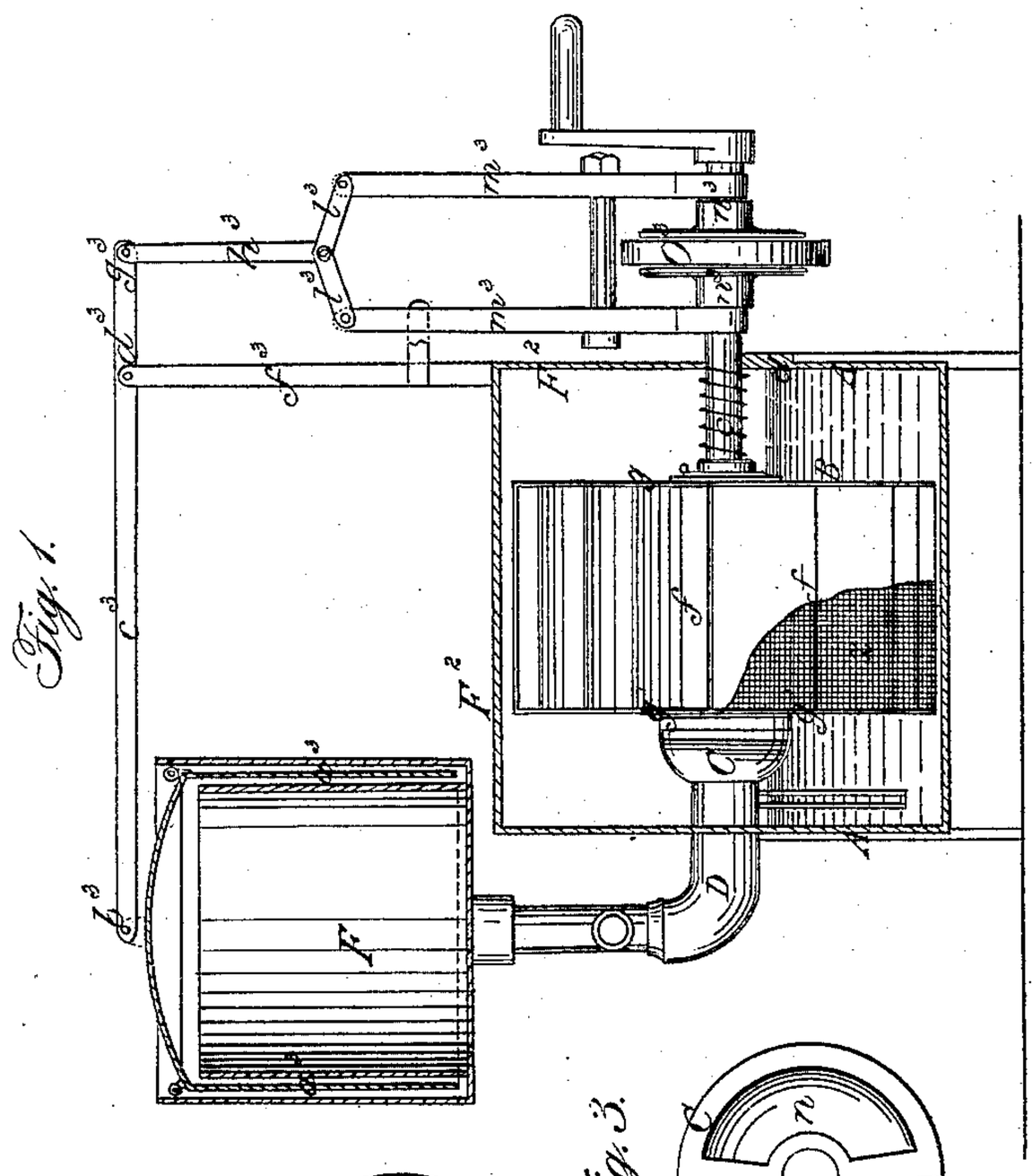


Fig. 4.

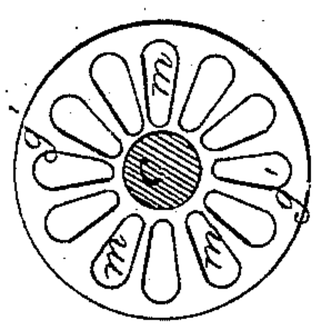
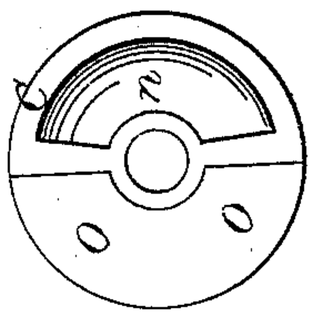


Fig. 3.



Witnesses:

Jno. B. Covington

Wm. Treurn

Inventor:

Jno. Chase

By Munn & Co

Attys

AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

JOHN CHASE, OF WINDSOR LOCKS, CONNECTICUT, ASSIGNOR TO S. E. HORTON, OF SAME PLACE.

IMPROVED APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. **50,987**, dated November 14, 1865.

To all whom it may concern:

Be it known that I, JOHN CHASE, of Windsor Locks, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Apparatus for Vaporizing Hydrocarbon Liquids for Illuminating; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The present invention relates particularly to an apparatus especially adapted to the manufacture of illuminating-gas from naphtha by passing atmospheric air through the same; and it consists, first, in covering the wheel, and for its whole extent, both in its length and periphery, with a sheet or sheets of wire-gauze or other suitable open or perforated material, the object of which is to secure a more perfect combination of the atmospheric air with the naphtha as it passes to the receiver, as will be presently more particularly explained; second, in a novel arrangement of parts for regulating the amount of gas generated in the apparatus, the same being connected with the gas-receiver at one end and with the driving-shaft of the chambered wheel at the other in such a manner that when the pressure of gas within the reservoir exceeds the desired amount, either in a greater or lesser degree, the revolution of the said bucket-wheel shall be in direct proportion thereto retarded in its movement, thus causing a greater or lesser quantity of gas to be formed and forced into the receiver, as the case may be, these regulating devices being self-operating, as will be manifest from the description of their arrangement and operation to be hereinafter fully given; and, third, in interposing between the gas receiver or generator and the burners employed for consuming the same, in the conducting-pipe thereof, a double-chambered tube or vessel formed by an inner and concentric tube made of wire-gauze or other suitable open material or substance, through which gauze tube the gas, in its passage to the burners, is obliged to pass, whereby the gas is thus relieved from all impurities and other condensable products which may be contained in it, the importance of which result for the production of a clear and perfect light from the gas when consumed is obvious to all conversant with the manufacture or use of illuminating-gases.

In the accompanying plate of drawings, my improvements are illustrated, Figure 1 being a central vertical section taken through the naphtha vessel or trough in the direction of its length and the gas-receiver, showing the revolving bucket or chambered wheel with connecting parts in side elevation; Fig. 2, a transverse vertical section of the naphtha-trough and its revolving wheel, together with the gas-receiver and filtering-chamber for the gas, in similar section; Figs. 3 and 4, detail views of portions of the apparatus, which will be hereinafter more particularly referred to.

A A in the drawings represent a trough or reservoir made of a semicircular shape in cross-section and of any suitable length and size, in which trough and to the proper height naphtha or other suitable hydrocarbon liquid which it is desired to convert into gas is placed, as shown by blue lines in the drawings.

B is a wheel, hung by its shaft, *c*, at one end in the end piece, *d*, of the trough A, and at its other in the projecting and enlarged end C of the pipe D, communicating at its other end with the gas receiver or reservoir F, made of the usual form and construction of gas-receivers now in common use. This wheel B, in the direction of its length, is divided into a series of similar shaped-chambers or compartments, *d d d*, extending from its outer periphery in and toward the center axis of the same, by partition-plates *f f f f*, bent into the shape plainly seen in Fig. 2, and secured at each end to the heads *g g'* of the wheel, each division-plate being of such a shape or form that when inserted in the wheel it shall extend through the quadrant of the circle described by its outer periphery or circumference, or nearly so—that is, as from *h* to *l*, in Fig. 2—the chambers *d d d*, being open at their outer ends or at the periphery of the wheel, and communicating at their inner portions through an aperture, *m*, for each chamber in the head *g'* of the wheel, at the proper times, as will be hereinafter specified, with the semicircular opening *n*, in the face of the enlarged portion C of the pipe D, before referred to, and the naphtha reservoir or trough.

The naphtha-trough has a cover or lid, F^2, attached to its upper portion, which cover wholly incases the wheel B, and has a valve, G, at one of its corners provided with a valve-plug, *o*, suitably arranged for admitting air to its interior, while at the same time its exit therefrom through it is entirely prevented.

To the outer end of the chambered or bucket wheel shaft *c* any suitable motive power may be connected, such as is now ordinarily used in apparatus employed for generating gas from hydrocarbon liquids, and which, therefore, it is not necessary for me to herein particularly explain. As the bucket-wheel revolves the air contained in its respective buckets or chambers, as they in turn pass into and through the naphtha in the trough, becomes gradually compressed thereby, which air, when the apertures *m* of the chambers come opposite to the circular-shaped opening *n* in the face of the pipe D, before referred to, escapes therefrom and up into the receiver or receptacle F, provided for the same through the connecting-pipe D, where it is stored, and from which, as it is wanted, it can pass through a suitable outlet or supply pipe communicating with it to the burners used for its consumption for illuminating or any other purpose to which it may be adapted. The circular opening in the connecting-pipe to the gas-receiver is of such a length and also placed in such a position with regard to the exit-apertures in the buckets of the wheel for the air compressed therein, as described, that communication between it and the said exit ports or apertures shall not be established until the pressure upon the air contained in the bucket-chambers shall be equal to or exceed more or less the pressure of the gas collected in the reservoir, this communication coming to a close the moment such pressure is below the requisite amount, when the apertures or ports then communicate with the cut-away portion *o*, of the said face of the pipe D, freely allowing the naptha contained in the respective chambers of the wheel as they come in communication therewith, to escape from them as the wheel continues its revolution, and as is obvious without further explanation. By thus forcing air into the receiver or reservoir G through naphtha or other hydrocarbon liquids, as described, it is manifest that hydrocarbon gaseous vapors are consequently formed, and that a continual and even supply of them to the gas receiver or burners is obtained, as a certain and equal number of the chambers are always in communication with the pipe leading thereto.

Over the periphery of the bucket-wheel, and entirely incasing the same, I secure a sheet of wire-gauze or other open or perforated material *z*, which, as the wheel revolves in the naphtha, serves to produce a thin film, as it were, about and over the openings to its chambers, so that as the air rushes through the perforations of the said plate the naphtha is thus more fully exposed to it, and consequently the generation of gas greatly facilitated and increased.

To the upper portion of the inner and loose casing, a^3, of the gas-receiver is hung by a pivot-joint, b^8, a horizontal connecting-bar or rod, c^3, turning upon a fulcrum at d^3 of the fixed post f^3 of the apparatus, upon the outer end, g^3, of which rod a short bar, h^3, is hung, connected at its lower end, through links l^3 l^3, to similar upright bars, m^3, placed loosely upon the driving-shaft *c*, hereinbefore referred to, so that as the inner casing for the gas-receiver rises from the pressure of gas therein, the friction-clutches n^3 n^3 upon the driving-shaft shall be proportionately brought to bear against the pulley-wheel o^3 thereof with more or less friction, as the case may be, thereby correspondingly retarding the revolution of the bucket-wheel, and the consequent generation of gas thereby.

In lieu of connecting the above-described arrangement of mechanical devices to a gas-receiver, as explained, if the gas-receiver is dispensed with, they may be connected with the ordinary supply-pipe for the burners from the gas-generator, it being only necessary that the connection should be made in such a manner that the action above explained will take place from the action of the pressure of the gas within the pipes.

In order to relieve the gas produced by the generator from any and all impurities which it may contain and other condensable products before it reaches the burners or other devices through and by which it is consumed or employed, I insert at any suitable point between the said generator and the supply-pipe connecting it with the burners and communicating with both a double-chambered pipe, p^3, to the inner one of which, s^3, the gas as it passes from the generator enters, and escapes therefrom out through its perforated or wire-gauze sides t^3 t^3 into its other and surrounding chamber w^3, from whence it passes through and into the supply-pipe. In thus passing it through the wire-gauze pipe it is obvious that its impurities must be in a great measure relieved, the advantages of which are apparent.

Although I have herein particularly described my apparatus as applied to the generation of gaseous vapors from naphtha by passing air through the same, it is obvious it can be applied to other and various purposes, such as, for instance, the collecting of air, &c.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. Entirely surrounding or covering the open ends of the wheel chambers or compartments with a sheet or sheets of wire-gauze or other suitable open and perforated or porous substance or material, for the purpose specified.

2. Regulating the amount of gas or other vapor generated or collected by the operation of the chambered wheel B, as described, by means of any suitable arrangement of devices

connected at one end with the driving-shaft of the said wheel and at the other with the reservoir or pipe containing such gas or vapor, and operating substantially in the manner specified.

3. Passing the gas or other vapor, after being generated or collected and previous to its being burned or otherwise employed, through wire-gauze or any other suitable open and porous material, substantially as and for the purpose described.

The above specification of my invention signed by me this 4th day of August, 1865.

JOHN CHASE.

Witnesses:

M. M. LIVINGSTON,

ALBERT H. BROWN.