

WATSON & CART.
Gas Generator.

No. 6,729.

Patented Sept. 18, 1849.

Fig. 2.

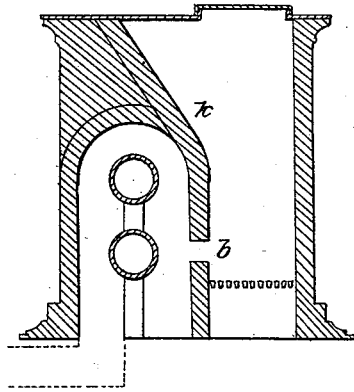
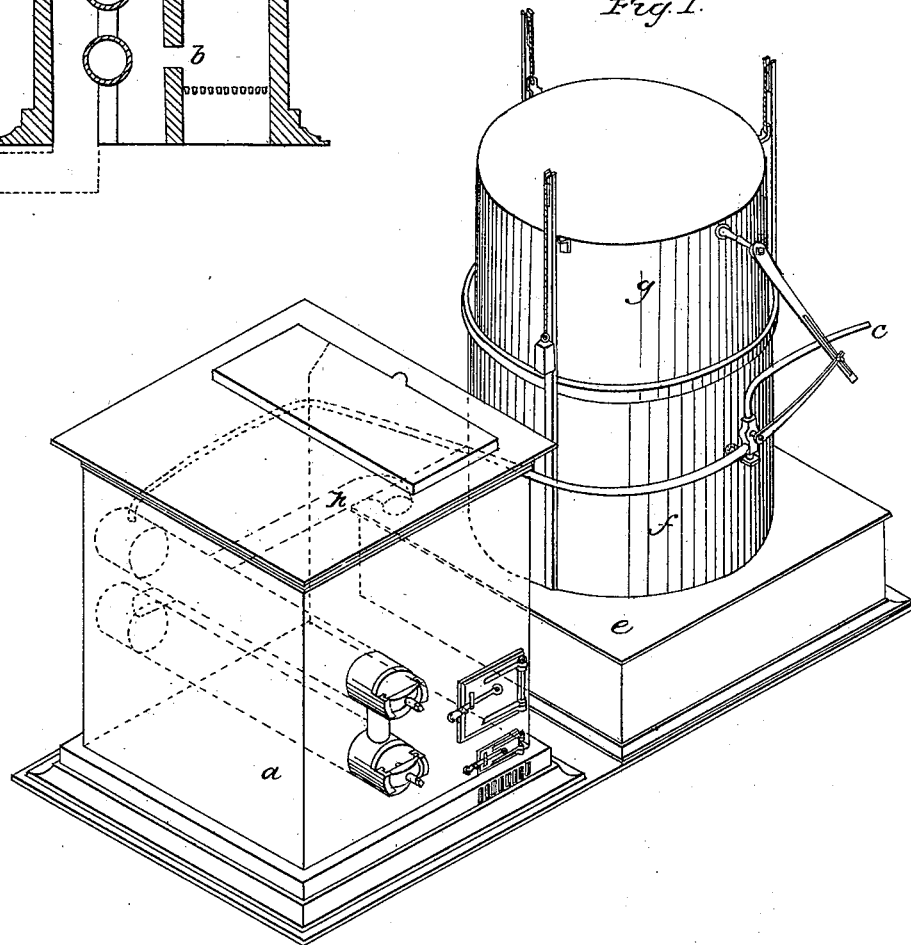


Fig. 1.



UNITED STATES PATENT OFFICE.

JOHN WATSON AND EDWARD CART, OF NEW YORK, N. Y., ASSIGNORS TO ALBERT WOODHULL AND CHARLES MONTURN.

GAS-GENERATOR.

Specification of Letters Patent No. 6,729, dated September 18, 1849.

To all whom it may concern:

Be it known that we, JOHN WATSON and EDWARD CART, of New York, N. Y., have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

The object of the improvements herein set forth is to produce greater economy in the construction of apparatus for the manufacture of illuminating gas, which improvements cause also a further saving in the room required to hold said apparatus,—in attendance of workmen, and in the cost of producing the gas itself.

The first of these improvements consists in so constructing the retort furnace that it can receive the whole charge of fuel required to generate a given quantity of gas. And also the regulating of the draft of air to the fire, and the escape of heat therefrom so that the rate at which the fuel is to be consumed will be such as to prolong the combustion over a period of time equal to that for which the gas generated by it is to be used. And secondly, combining the gas holder with the pipe or channel which conveys the materials for making gas, to the retorts, by a throttle valve, stop cock, or like contrivance so that the quantity of materials fed will be in ratio to the gas at any time used.

In Figure 1 is a perspective view showing the general appearance of our apparatus. At the letter (a) is the furnace containing the retorts, this is composed of suitable materials to resist the action of fire. Interiorly we divide it into two compartments, as seen in the section Fig. 2 by a partition wall of like materials with the body of the furnace or its lining, on one side of the partition we place the retorts and in the other the grate bars, raking door, ash pit door and register to regulate the admission of air, and stoking hole. It also forms the receptacle for all the fuel to be consumed at a given operation. This is an important feature in our apparatus as without it, the necessary and frequent attention required to renew the fire would do away with the necessity of much of the other apparatus, as without the ability to supply fuel for a greater length of time than in the old furnace.

Our invention could not be considered self-acting for were it necessary to have an attendant always on the watch to renew the fire, so could he renew and regulate the feed

and supply of gas. Thus then by the formation of a separate reservoir in the retort chamber combining the two together all the fuel required to make gas for a given time which time is usually extended to a period of several hours, and therefore far beyond any time required for the combustion of a furnace full of fuel on the old plan. In order that it may the better serve for this latter purpose, we prefer to give the partition a hopper shape at the top, as shown in the drawings (K Fig. 2). At (b) there are a series of grate like openings extending across the whole of the partition wall, through these openings the flame smoke &c. pass into the other chamber of the furnace in order to reach the discharge flue which goes out of it, here they are made to act upon the retorts which are placed opposite to these openings in such a way as to receive the greatest effect of the heat. And the object of these openings is to cause an equal distribution of the fire all along the retorts. The drawings represent double retorts, which we prefer, but single ones may be employed. The double retorts serve to resolve a greater proportion of the oil into gas by reason of its more extended surface, as in all olefiant gas works more or less oil passes over unchanged. The upper retort receives the delivery end of the feed pipe which brings the oil for making gas; as much of it is there made into gas as it has the capacity to do when the whole passes into the lower retort, and the operation there continues on any oil coming over, (C) is the feed pipe which enters the retort at the back end and is affixed in the usual manner, the opposite end terminates in a reservoir to hold the oil or other materials from which the gas is to be made, this reservoir must have an elevation above the retorts sufficient to feed in by gravity. At (e, f, g,) is seen the gasometer consisting of washer, water tank, and gas holder. The washer (e) is situate at the base and is of common construction. The gas flows into it through the pipe (h) from the retorts, and is there properly purified, after which it ascends up through a pipe, which rises in the tank (f) so as to be above the level of the water, and discharges into (g), and from (g) it is fed to the burners in the usual method. We sometimes place a vessel between the washer and retorts which we call an oil saver, to

this the pipe (*h*) is connected so that it will leave all the oil which may come over with the gas, in it, previous to going into the washer; as it is an apparatus well known
5 we do not deem a further description necessary.

In the feed pipe (*c*) there is a valve or cock placed intermediate between the reservoir and the retorts represented at (*i*), from
10 a lever attached to this cock there is a connecting rod which is affixed to the head of the gas holder (*g*) as seen at (*o*) so that the rising and falling of the gas holder will effect the opening and closing of the cock
15 or valve (*i*). The gas holder (*g*) is held in suspenders as usual, but so that it cannot swing round, but must rise and fall vertically. The operation is as follows, having ascertained the amount of fuel necessary to
20 make the greatest amount of gas which the apparatus is capable of producing, that quantity is put into the fire chamber of the furnace and having fired it, by experiments find the required openings to be made in a
25 register of common construction for admitting air, and also the set of a damper of like common construction in the flue to cause that rate of combustion which will be required to make gas for the time it is to be
30 wanted. This done these relative positions of damper and register should never be altered unless the period of time for consuming the gas is to be changed or its quantity diminished (and we recommend that as
35 few changes as possible be made after our apparatus has been constituted and regulated to do a certain work, and we would also here further remark that by these improvements it is easy to extend the time of
40 making gas to twelve or eighteen hours, without any attendance whatever after the apparatus is once properly started). These several things being done, the rest is wholly self acting. The rising and falling of the

gas holder, acting on the throttle valve or
45 cock (*i*) regulates exactly the quantity of the oil to the retorts required for a given consumption of gas. If the whole number of burners are set on, then the gas holder settles down to a point to allow of the larg-
50 est passage of raw materials through the feed pipe and so from this point it takes different positions, as the consumption of gas may from time to time vary.

From what we have now said we have
55 made it apparent that by our improvements as set forth we can greatly reduce the size and cost as well as other attendant disadvantages in the old mode of gas making
60 avoiding besides, the necessity of making vast stores of gas in advance of its consumption, and thereby avoiding the greater danger from explosion and fire.

What we claim as our invention and desire
to secure by Letters Patent is—

65 So constructing the retort furnace that it can receive the whole charge of fuel required for a single operation, and so managing the combustion of the fuel by setting
70 the controlling dampers that it shall cover the space of time usually allotted to the consumption of the gas by the burners, when this arrangement of furnace and damper is combined with the gas holder that controls
75 the feed to the retort and supplies the same according to the consumption of the burners, as set forth and described herein.

JOHN WATSON.
EDWARD CART.

Witnesses to the signing by the said John
Watson:

JOHN SAXELLRFE,
GEO. SMITH.

Witnesses to the signing by the above-
named Edward Cart:

EDWARD WILLARY,
W. R. BARNES.