3 Sheets--Sheet 1.

A. GLACHET.

Gas-Machine.

No. 168,390. Patented Oct. 5, 1875.

Fig 1.

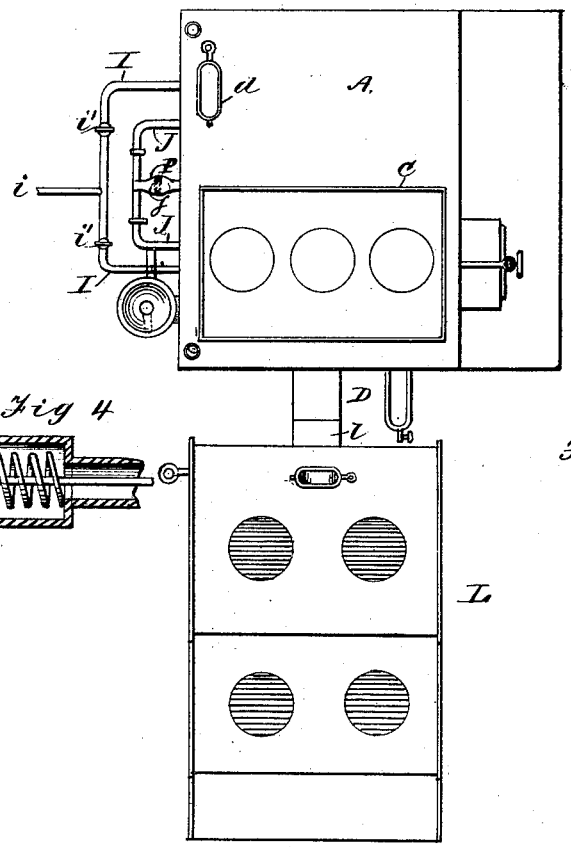


Fig 4

Fig 5

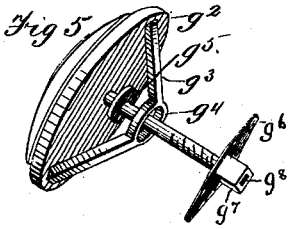


Fig 2.

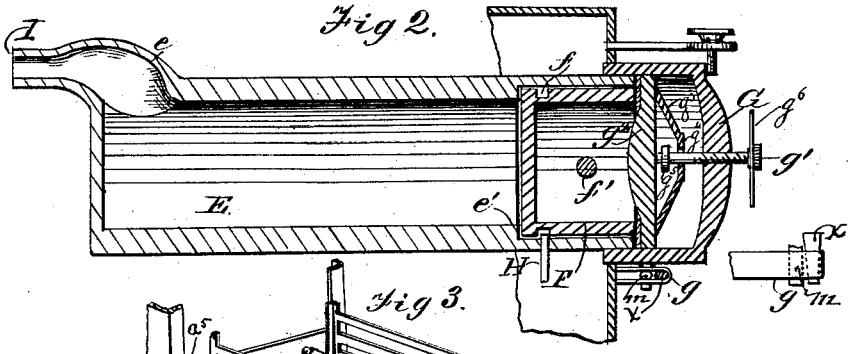
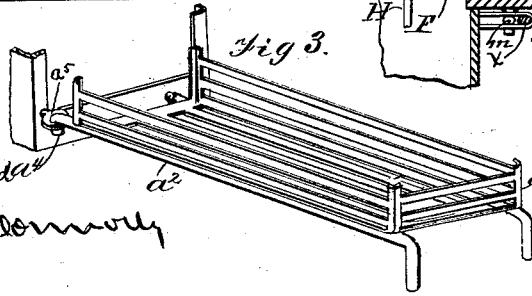


Fig 3.



Witnesses

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A. GLACHET.
Gas-Machine.

No. 168,390. Patented Oct. 5, 1875.

Fig 6

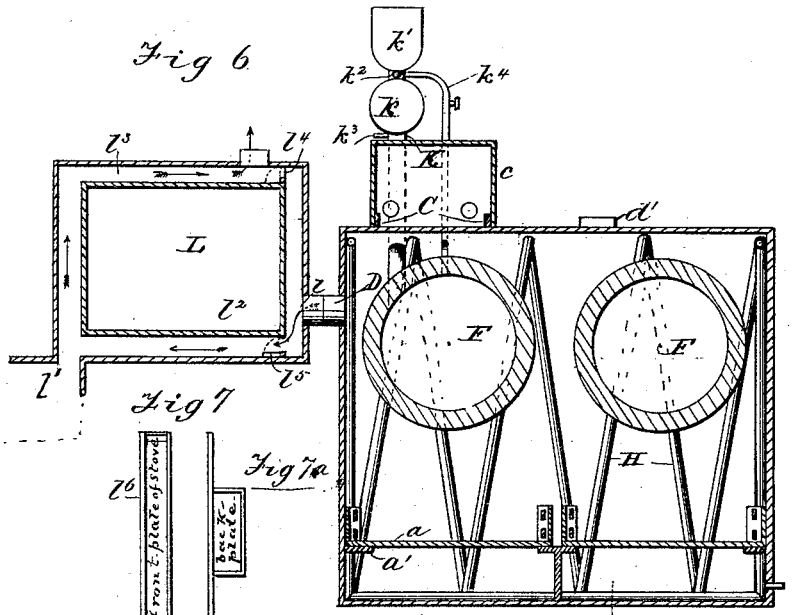


Fig 7

Fig 7a

Fig 8

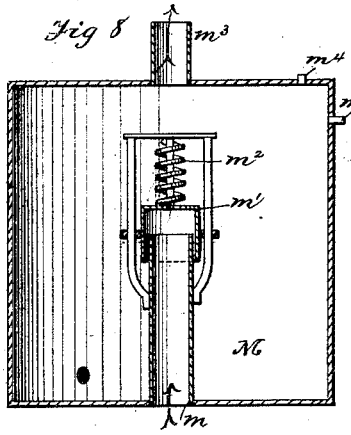


Fig 9

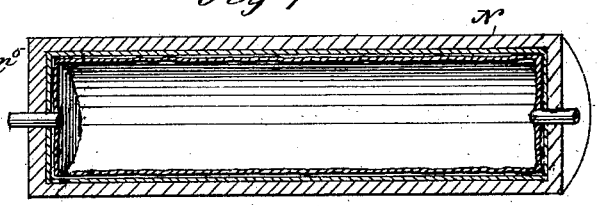
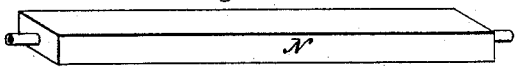


Fig 9a



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3 Sheets--Sheet 3.

A. GLACHET.

Gas-Machine.

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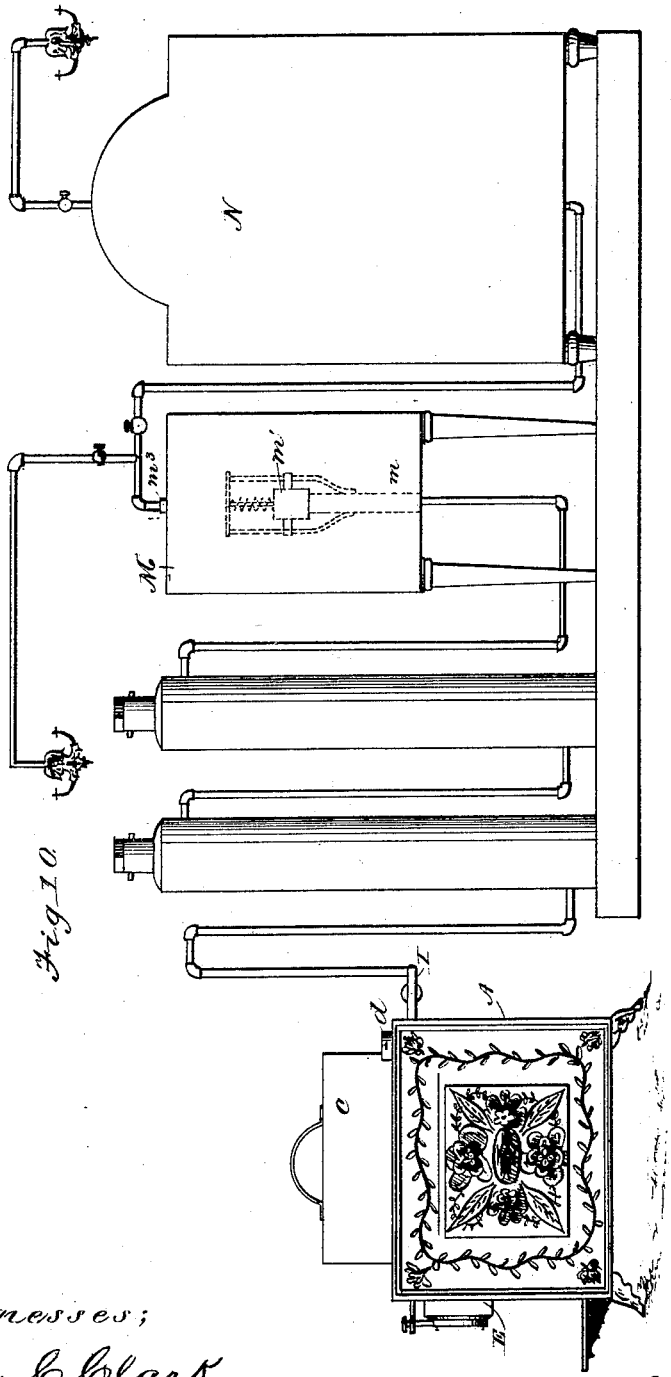

Witnesses;
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Chas A Brainerd

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his Attys.

UNITED STATES PATENT OFFICE.

ADONIS GLACHET, OF ALEXANDRIA, VIRGINIA.

IMPROVEMENT IN GAS-MACHINES.

Specification forming part of Letters Patent No. **168,390**, dated October 5, 1875; application filed September 15, 1875.

To all whom it may concern:

Be it known that I, ADONIS GLACHET, of Alexandria, in the county of Alexandria and State of Virginia, have invented a new and useful Improvement in Gas-Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention consists mainly, first, in the combination of a main and auxiliary stove of special construction; second, in providing the stove with a system of steam-pipes, adapted to discharge into the mouth of the retort; third, in the peculiar arrangement of a system of relief-pipes and safety-valves; and, fourth, in the special construction of the retort. It consists, further, in certain details of construction, which, in connection with the foregoing, will be fully described hereinafter.

In the drawings, Figure 1 represents a plan view of my improved apparatus; Fig. 2, a central sectional elevation of the retort; Fig. 3, a proportional view of the grate as withdrawn from the stove and sustained by the supporting-rods; Fig. 4, a sectional elevation of the safety-valve; Fig. 5, a perspective view of the inside cover; Fig. 6, a sectional view of the two stoves; Fig. 7, a side elevation of the front plate detached; Fig. 7^a, a side elevation of the detached back plate; Fig. 8, a sectional elevation of the last purifying-chamber. Fig. 9, views of the gasometer; and Fig. 10, a side elevation of the entire apparatus.

To enable others skilled in the art to make and use my invention, I will now proceed to describe fully its construction and manner of operation.

A represents the stove adapted to contain the retorts, which may be constructed generally of any proper size and suitable shape; but is essentially provided with proper openings for receiving the retorts and suitable supports for retaining them in proper position.

The stove is preferably made double, with two retorts of similar construction, so arranged that they may be used independently or together.

a represents the grate, of suitable construction, extending beneath the coal and supported upon ledges a^1, or any other suitable manner. a^2 a^2 represent rods provided with right-angled legs a^3 a^3 and hooked ends a^4, which are adapted to be caught into the sockets a^5 of the stove, and furnish proper supports for the grate when it is pulled out, as indicated in Fig. 3. C represents a quadrangular flange or rib surrounding the pot-holes upon the top of the stove, which is adapted to form a light joint with the removable oven *c*, as shown. D represents the main pipe, communicating with the auxiliary stove, and d^1 a subordinate pipe, which may, if desired, communicate directly with the chimney. E E represent the retorts, of similar construction, each of which is preferably of cylindrical form, as shown, and is provided with a tapering discharge-pipe, *e*, Fig. 2, projecting from the inner end of the retort and from its top side, which is made sufficiently strong to support this end of the retort. The front end of the retort is provided with a bearing-shoulder, *e'*, as shown. F represents a follower for closing the retort, consisting of a cylinder closed at one end and provided with a circumferential groove, *f*, as shown. *f'* represents a cross-bar, by means of which it is readily removed and inserted in place. If desired, a handle of any other description may be employed. G represents the door, consisting of a cylindrical casting provided with suitable ears *m*, by means of which it is loosely attached to the hinges or supports *g*, and also with a central threaded rod, g^1, as shown. g^2, Figs. 2 and 5, represents an inner cover provided with a central disk-like projection adapted to project into the follower F, which is provided with any suitable packing, as shown.

g^3 g^3 represent arms converging to a central ring, g^4, by means of which and the disk or cross-piece g^5, on the threaded rod g^1, the cover is loosely connected to the rod and the door, so as to move with them when the door is opened and closed. The various parts employed to close the retorts are accurately finished, so that a tight joint is obtained without difficulty. The threaded rod g^1 is provided with a cross-bar, g^6, adapted to serve as a handle; a square head, g^7, is adapted to receive a wrench; and a square socket, g^8, adapted to hold a key, as shown in Fig. 5. H

represents a system of steam-pipes within the stove, one end of which is connected to a reservoir, or any other proper source of water-supply, and the other caused to discharge within the circumferential groove of the follower F, as shown in Fig. 2. If desired, also, a pipe may be connected with this system for conveying steam or hot water to other apartments, for heating purposes. It may also be connected with a water-tank of the gasometer, if a water-tank is employed, for the purpose of preventing freezing in cold weather. I I represent the pipes leading from the retorts, which unite in a main pipe, *i*, leading to the purifier, which pipes are provided with cocks i^1, so that either may be used independently of the other, if desired. J J, Fig. 1, represent pipes also leading from the retorts, which unite in a main pipe leading back into the stove, which is provided with a spring-valve, *j*, Fig. 4, as shown. K represents a pipe, the lower end of which discharges within the retort near its top, which is provided near its upper end with the spheroidal vessel *k*, receiver k^1, and stop-cocks k^2 k^3, as shown. k^4 represents a pipe extending from within the retort, also near its top, to the pipe K, above the spheroidal vessel *k*, as shown. L represents an auxiliary stove, united by means of the section *l* to the main stove, as shown. It is provided with a fire-box, l^1, oven l^2, and flue l^3, extending entirely about the oven L, as shown. l^4 l^5 represent dampers adapted to control the communication with the flue about the oven. l^6 represents a double front plate, designed to supersede the single plate in stoves already in use. l^7 represents a back plate, designed to be substituted for back plates now in use, which is provided with a pipe-flange, adapted to make connection with the main stove, as shown. By means of these independent plates stoves now in use may be readily adapted for use with my improved apparatus. M represents the last purifying-chamber, provided with the entrance-pipe *m*, having a cover or cap, m^1, held by the spring m^2, as shown. m^3 represents the discharge-pipe; m^4, a pipe for supplying the chamber with water, and m^5 a cock, located at the water-line, for the purpose of drawing off any gas-tar which may accumulate therein. N represents the gasometer, consisting of a flexible bag or sack, preferably composed of india-rubber, provided with suitable pipe-connections at each end, and having an adjacent protecting case of metal and outer case of wood, as shown in Fig. 5. This is preferably made cylindrical in shape for dwellings, as shown in Fig. 9, but in the form of a parallelopiped for cars, as shown in Fig. 9^a.

The operation is as follows: Coal having been placed in the retort, the opening is closed by the snugly-fitting follower and the cover g^2, the latter being screwed to place by the rod g^1 after the door G is secured by means of the keys *x x*, as shown. By this means a very secure joint is obtained, and leakage is almost impossible. For further security, however, a jet of steam is discharged into the circumferential groove of the follower, which has a tendency not only to prevent the egress of the gas through the door, but also to force it toward the discharge-pipe. The presence of the steam also has the effect of tempering the gas and improving its quality. The gas having been evolved, it is conveyed by the pipes described to the purifier and gasometer. If grease is used, it is placed, after being properly melted, in the receiver k^1, and allowed to flow into the spheroidal vessel below. The cock k^2 being closed, and the cock in pipe k^4 being opened, pressure is admitted from the pipe k^4 above the grease, and, the cock k^3 being opened, it is at once forced into the retort. If from any cause a stoppage should occur in any of the main pipes, relief is given by means of the relief-pipes J and safety-valve *j*, the spring of which, yielding under excessive pressure, permits the valve to open and the gas to flow into the stove, where it is consumed without producing any injurious result. The gas, in reaching the last purifying-chamber, is compelled to make an abrupt turn, and pass down through the water, by which means it is thoroughly cleansed.

The main stove should be used when it is desired to make gas, at which time the auxiliary stove may be employed for cooking purposes by simply arranging the dampers as represented in Fig. 6, so that the heat will pass through it.

When it is not desired to make the gas the auxiliary stove is employed for cooking, and connection is cut off with the main stove, so that the retorts are not exposed to heat, except when in use.

Some of the advantages of the described construction are as follows: By the employment of two stoves, as described, the retorts are not exposed to heat when not in use, and when in use no other fire is necessary for cooking purposes. The construction of the retort is advantageous, because a tight joint is readily made by simple means. In consequence of the construction described, that part of the retort holding the coal is located away from the side of the stove, so that it is fully exposed to the heat, and consequently no coal is left unburned in the ends of the retort to give off gas when the door is opened, as occurs when all the coal is not equally exposed to the action of the heat.

It will be understood that the follower in the retort retains the coal in the proper position to be equally acted on, so that all the gas is evolved before the door is opened, so that no smell is perceptible in the room.

The employment of the steam-jet is advantageous, because it assists in perfecting the joint which closes the retort, and also acts upon the gas, as described. In addition, also, it protects the follower and covers from excessive heat, so that no injury results from excessive expansion.

The location of the discharge-pipes of the retort at the upper side of the same is advantageous, because it relieves them from danger of being clogged by the contents of the retort. The shape, also, is such that the gas readily escapes from the retort, and thus relieves it from excessive pressure. It is also adapted in form and by its strength to support the inner end of the retort without other means.

The employment of the safety-valve is advantageous, because all danger from injury from stoppage in the pipes is avoided. The construction of the rod g' is advantageous, because it may be turned by the hands or by a wrench or key, so that either the arms may be broken or the turning devices lost without entirely impairing its capacity for operation.

The employment of the grate and the supporting-rods is advantageous, because a shallow grate may be employed, and it may be readily withdrawn whenever it needs attention. The construction of the gasometer is a desirable one. No water is required, and hence there is no danger of freezing. The inner metal case prevents the leakage of gas, and the outer case protects both the inner cases from injury from any cause.

A special advantage also results from the peculiar relation existing between the retort and the removable grate. In order to act readily upon the retort it is essential that the burning fuel shall be in close contact therewith, and hence, in consequence of its close position, it cannot be revolved, but must be withdrawn. By means of the construction described the retort is directly exposed to the heat, and the grate may be readily withdrawn, when necessary, to remove the coal or for other purposes.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the main stove, having retorts, as described, with the auxiliary stove, having the flue l^3, as described.

2. The main stove, provided with its system of steam-pipes discharging into the groove of the retort.

3. The combination of the retort, the relief-pipe, and safety-valve with the fire-chamber, the relief-pipe being adapted to discharge into the fire-chamber when the valve is operated, as described.

4. The combination of two or more retorts with independent relief-pipes with a main pipe and single safety-valve, substantially as described.

5. The combination of the retort, provided with a bearing-shoulder, located at a distance from the end of the retort, with a cylindrical follower having a solid end, adapted to slide in the mouth of the retort and bear against the shoulder, as described.

6. The combination of the retort, the follower, the cover, and the door, as described.

7. The combination of the cover, provided with the rods g^2, ring g^4, the threaded and disked rod g^1, and door G, as described.

8. The combination of the cylindrical door, the loose hinges and fastening-keys, as described.

9. The entrance-pipe m of the purifier, cap m^1, and spring m^2, in combination with the guide-rods, as shown.

10. The gasometer, consisting of a flexible bag, an intermediate metal inclosing-case, and an external protecting-case of wood, as described.

11. The threaded rod g^1, provided with the cross-bar, the square head for receiving a wrench, and square socket for holding a key, as described.

This specification signed and witnessed this 15th day of September, 1875.

ADONIS GLACHET.

Witnesses:
C. A. BRAINERD,
H. W. BEADLE.