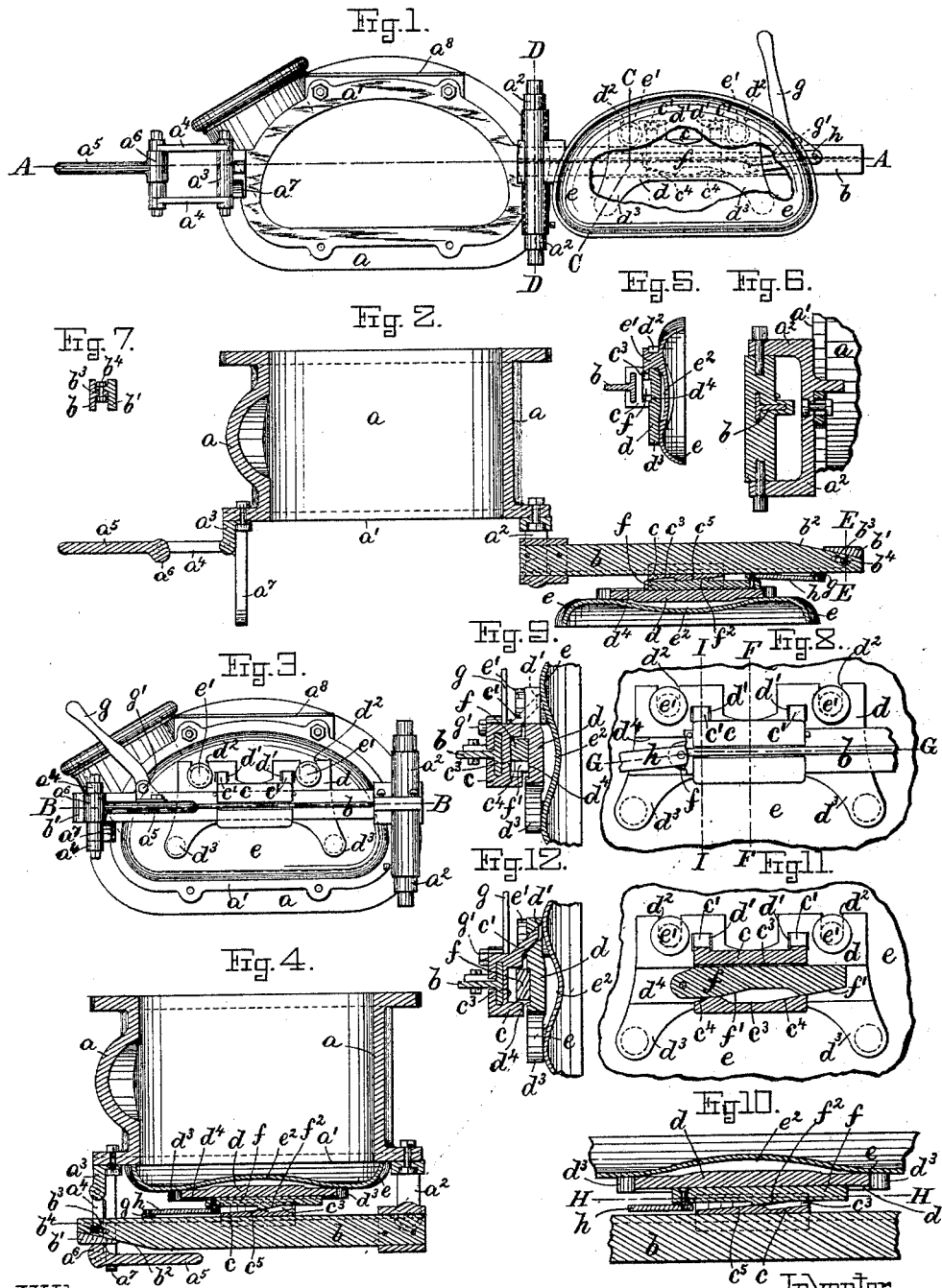


(No Model.)

J. P. CLARK.
RETORT LID.

No. 491,769.

Patented Feb. 14, 1893.



Witnesses

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UNITED STATES PATENT OFFICE.

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RETORT-LID.

SPECIFICATION forming part of Letters Patent No. 491,769, dated February 14, 1893.

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To all whom it may concern:

Be it known that I, JOSIAH P. CLARK, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Retort-Lids; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in retort lids, more especially in those adapted to be used in gas works, and has for its object to produce a lid, easily operated and light, which can always be seated gas tight against the mouth of the retort when the lid is closed and fastened.

It consists in providing the lid with mechanism whereby it can be moved upon the face of the mouth of the retort, at the same time being forced against such face thus removing any dust, tar, lamp black or other substance from between the meeting faces of the lid and mouth piece and forming a gas tight joint between such faces.

It consists also in minor details of construction as will be set forth hereinafter and illustrated in the accompanying drawings, wherein:

Figure 1 represents a front elevation of a mouth-piece and lid of a retort provided with my improvements, showing the lid in its open position and having a portion of the lid broken away exposing a part of the operating mechanism. Fig. 2 represents a horizontal section of the same on the line A—A in Fig. 1. Fig. 3 represents a front elevation of a mouth piece and lid of a retort provided with my improved attachments, showing the lid in a closed position. Fig. 4 represents a horizontal section of the same on the lines B—B in Fig. 3. Fig. 5 represents a vertical cross section of the lid on the line C—C in Fig. 1. Fig. 6 represents a vertical section on the line D—D in Fig. 1 showing the manner of hinging the lid to the mouth-piece of the retort. Fig. 7 represents a detailed cross section on the line E—E in Fig. 2, showing the manner of adjusting the amount of force with which the lid is held against the mouth-piece and of compensating for the wearing of said parts. Fig. 8 represents a detailed front elevation of

the mechanism employed to produce a tight joint between the faces of the lid and mouth-piece of the retort. Fig. 9 represents a vertical cross section on the line F—F in Fig. 8. Fig. 10 represents a horizontal longitudinal section on the line G—G in Fig. 8. Fig. 11 represents a vertical longitudinal section on the line H—H in Fig. 10. Fig. 12 represents a vertical cross section on the line I—I in Fig. 8.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

Heretofore the joint between the lid and mouth-piece of a retort has been made tight either by luting said joint or by having the faces of the lid and mouth-piece planed or ground to a surface and held together by the application of direct pressure of the lid against the mouth-piece. The luting of the joints has proved to be expensive, laborious and otherwise unsatisfactory, and has been abandoned at most gas works on this account and the method of planing or grinding the joint and applying the pressure to the lid has been adopted, but by the use of this latter method one is not always sure of getting a gas tight joint on account of the particles of tar, lamp black or other substances which are liable to get between the meeting faces of the lid and mouth-piece and preventing them from being pressed tightly together. To remove these particles and insure a tight joint is the principal object of this invention.

The mouth-piece *a* of the retort is provided with the face *a'*, which is planed or ground to a true surface in the usual manner. To one side of the mouth-piece is adjustably attached the bracket *a²* to which is hinged the T-iron bar *b* forming a support for my improved device, described hereinafter. To the opposite side of the mouth piece *a* to where the bracket *a²* is attached, is adjustably secured a second bracket *a³* to which is pivoted the links *a⁴* *a⁴* between the outer ends of which is pivoted the locking handle *a⁵* the inner end of which is made cam shaped or eccentric as shown at *a⁶* in Figs. 2 and 4. The handle *a⁵* is adapted to press against the end of the bar *b* or against an adjustable seat-piece *b'* attached thereto, when in the position shown in Fig. 4, exerting a pressure upon

the lid *e* and holding it firmly against the face *a'* of the mouth-piece. The bar *b* is preferably provided at its outer end with this seat piece *b'* made adjustable upon the incline *b²* on the end of the bar by means of the slot *b³* in the bar and the bolt or set screw *b⁴* passing through said slot and into the seat piece. This allows the device to be adjusted at this point to compensate for any wear or to vary the pressure of the lid against the mouth-piece. It will be seen that if the pressure exerted by the operation of the handle *a⁵* is not sufficient to hold the lid gas tight it is only necessary to loosen the bolt *b⁴* and to adjust the seat piece *b'* farther up on the incline *b²*. Upon the T bar *b* is placed the block *c* which is provided with a groove into which the bar is inserted and fastened by pins driven through said bar. The block *c* is provided with two or more upwardly inclined projections *c'* which pass through perforations *d'* in the plate *d* and support said plate. To this plate is hung the lid *e* by means of two or more grooved lugs, *e'* projecting from the outside surface of the lid and resting in forked notches *d²* on the upper edge of the plate *d* as shown in Figs. 5 and 8, which plate enters the grooves on said lugs and prevents the lid from being accidentally detached from said plate without first raising the lid out of the forked notches, but still allows the lid to be easily and quickly removed and replaced by another lid should it become broken or unfit for use. The plate *d* projects downward preferably in the form of two horns *d³* which rest against the outer surface of the lid or against lugs thereon. The incline of the lugs *c'* which support the plate *d* tends to keep the plate against the inner surface of the block *c* and any separation of said plate from said block, from any cause, will, on account of said inclined projections, tend to raise said plate and with it the lid *e* hung thereon, but they will be at once returned to their normal position by the weight of the lid and plate when this cause of separation is removed.

The raising and lowering of the lid, when it is closed, against the mouth-piece of the retort, and before the handle *a⁵* is operated to press the faces of the lid and mouth-piece together, causes the lid to move up and down upon the face of the mouth-piece and against the same, removing any dust, tar or other substance from between their faces and insuring a perfectly gas tight joint when the pressure is applied by the handle *a⁵*.

The movement of the lid above described I accomplish by the introduction of a wedge shaped bar *f* between the block *c* and plate *d*, which wedge rests within the groove *c³* on the inner surface of the block, and the groove *d⁴* on the outer surface of the plate *d*. This wedge is provided on its under side with inclines *f' f'* which co-operate with inclines *c⁴* on the lower surface of the groove *c³* on the block *c* as shown in Fig. 11, to help raise and lower the plate and attached lid when the

wedge is moved forward and back in the groove, as these inclines cause the upper portion of said wedge to press against the upper surface of the groove *d⁴* in the plate *d*, as shown in said Fig. 11. The wedge is also provided on its outer surface with the incline *f²* which co-operates with the incline *c⁵* in the groove on the block *c* as shown in Fig. 10, to separate the block *c* and plate *d* and thereby to press the lid against the mouth-piece and also allow it to rock independent of the T-bar and to seat itself fairly upon the mouth-piece. The wedge *f* is reciprocated longitudinally within the grooves *c³* and *d⁴* by means of the hand lever *g* pivoted at *g'* to the bar *b* or to a bracket attached thereto, and the link *h* connecting the hand lever with the wedge. The hand lever is provided with a handle by which it can be rocked upon its pivot by the operator in order to reciprocate the wedge.

The operation of my improved lid is as follows: Starting with the several parts in the relative positions shown in Figs. 1 and 2, and the retort charged ready for the lid to be closed, the operator swings the lid and T-bar with their attachments, to the positions shown in Figs. 3 and 4. He then grasps the handle *a⁵* and carries it over the end of the T-bar so that the cam *a⁶* will rest upon the seat-piece on the bar: he then rocks the hand lever *g* with one hand so as to remove any substance from between the faces of the lid and the mouth-piece in order to form a gas tight joint between said faces, at the same time turning the handle *a⁵* with the other hand to the position shown in Figs. 3 and 4, so as to cause the cam *a⁶* to press against the seat piece, forcing the lid firmly against the mouth-piece and locking it in this position.

I do not wish to confine myself to the exact mechanism shown for moving the lid upon the face of the mouth piece, nor to the direction in which said lid is moved as they may be varied within the scope of mechanical skill and any well known equivalents used without departing from this part of my invention, which consists broadly in providing mechanism to cause a movement of the lid upon and against the face of the mouth-piece of the retort so as to remove any dust, tar, lamp black or other substance from between the meeting faces, and insure a gas tight joint.

To prevent sagging of the T-bar and to guide the lid to its proper position on the mouth-piece, I provide the bracket *a³* with the projection *a⁷* upon which the T-bar *b* rests when the lid is closed. This projection is made inclined on its outer end so as to raise the end of the T-bar as the lid is closed. This projection also limits the movement of the handle *a⁵* when the handle is brought over the end of the T-bar in locking the lid. Heretofore the lids of retorts have been made flat and the desired amount of strength obtained by supplying them with a number of projecting ribs, but this construction is

faulty on account of the unevenness of expansion of the different parts of the lids when heated, causing the lid to warp and the joint between it and the mouth-piece to leak. To
 5 obviate this difficulty and also to make the lid lighter, I form the lid of even thickness throughout or approximately so and obtain the desired amount of strength by concaving the lid as shown at e^2 in Figs. 2, 4, 5 and 10.
 10 This causes it to expand evenly as it is heated and prevents it from warping.

A shelf or guard a^8 is attached to the mouth-piece in such a position as to prevent small pieces of coal or dust from dropping
 15 into the operating mechanism when retorts above are charged.

Having thus fully described the nature, construction and operation of my invention, I wish to secure by Letters Patent and claim:

20 1. The combination with a retort, of a supporting bar hinged to the mouth of the retort and provided with a grooved block having an inclined bottom, a lid carried by said bar, and a wedge having an outer inclined portion for
 25 engaging the inclined bottom of the grooved block so that the lid can reciprocate laterally against the mouth of the retort to remove dust, tar and the like, substantially as described.

30 2. The combination with a retort, of a T-iron bar hinged to the retort and provided with a grooved block, a grooved plate hung on the block, a retort lid hung on the plate, and a wedge adapted to be reciprocated in the
 35 grooves to move the lid upon and against the mouth of the retort, substantially as described.

3. The combination with a retort, of a retort lid having grooved lugs e' , a lid supporting bar hinged to the retort, a plate c carried by the bar and having upwardly inclined
 40 projections c' , and a plate d having perforations to receive the said inclined projections, and provided with notches d^2 the edges of which engage the grooved lugs on the retort lid, substantially as described.

45 4. In a retort lid, a lid supporting bar hinged to the retort, a cam or eccentric attached to

the retort constructed to lock the lid when closed, a block mounted on the lid supporting bar, inclined projections on the block, a plate supported by the projections, a lid hung on
 50 the plate, a wedge between and within grooves in the block and plate, inclines on the wedge and within the groove in the block to co-operate to produce a movement of the lid upon the mouth of the retort, for the purpose de-
 55 scribed, a hand lever to reciprocate the wedge, and a link connecting the hand lever with the wedge, substantially as described.

5. In a retort lid, a supporting bar hinged to the retort, a cam or eccentric attached to
 60 the retort to lock the lid when closed, a block mounted on the lid supporting bar, inclined projections on the block, a plate supported on the inclined projections and a lid carried by the plate, combined with a wedge and a wedge
 65 actuating lever interposed between the block and plate to separate them and thereby cause the lid to move upon and against the mouth of the retort, in order to remove dust, tar
 70 lamp black or other substances from between the lid and the mouth of the retort and to produce a gas tight joint between these parts when the lid is locked, as set forth and described.

6. The combination with a retort, and a retort lid, of a lid supporting bar b hinged at
 75 one end and provided at the opposite end with an incline b^2 , a shoe or seat-piece b' movable to different positions on the said incline, devices for adjusting the shoe or seat piece on
 80 the incline and holding it in a fixed position after adjustment, and a swinging handle a^5 having a cam a^6 which acts upon the adjustable shoe or seat piece to force the lid against the retort, substantially as described.
 85

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JOSIAH P. CLARK.

Witnesses:

HENRY CHADBURN,
 FREDERICK A. HARLOW.