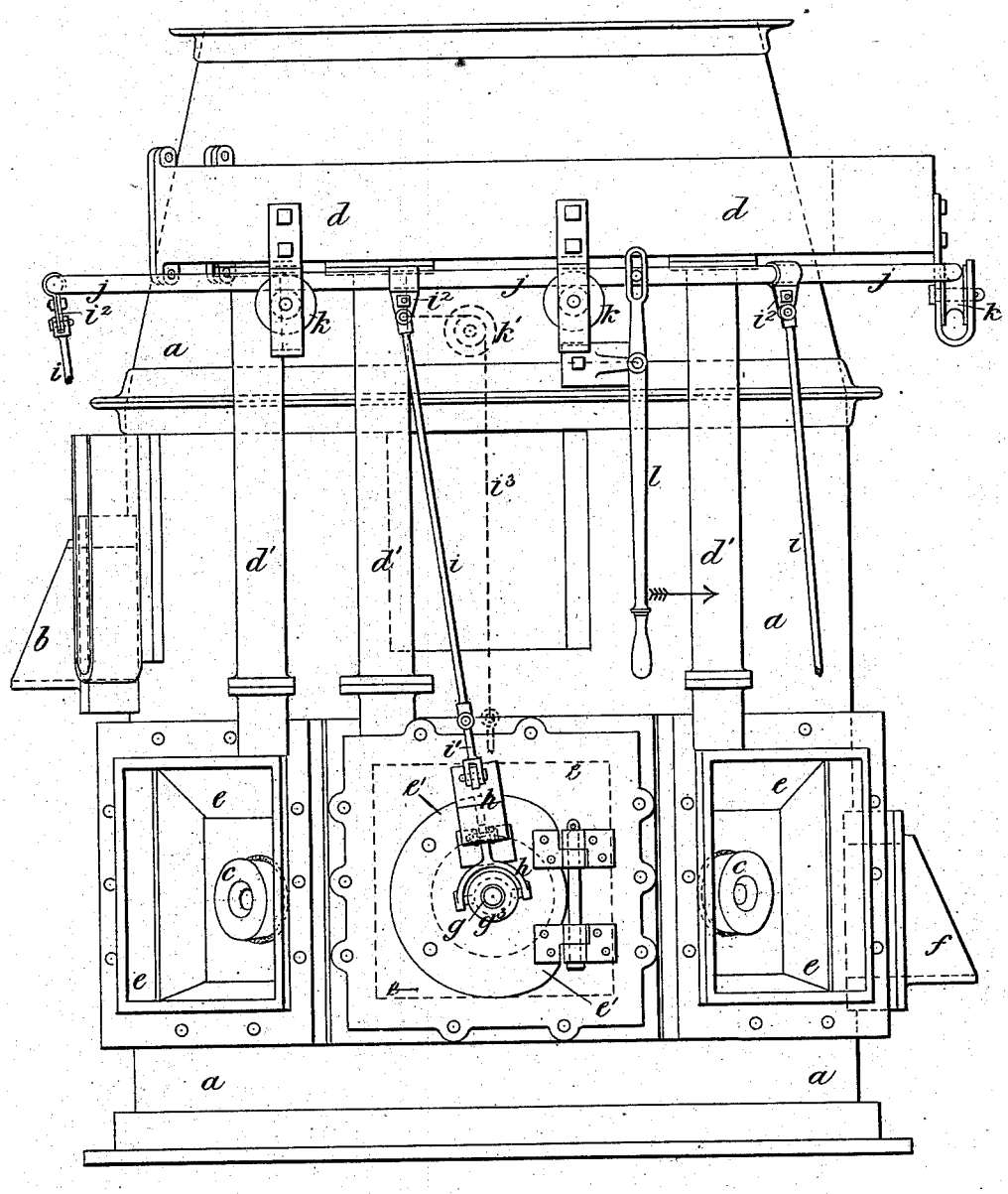
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T. GRIFFITHS.

CONVERTER.

No. 295,545. Patented Mar. 25, 1884.

Fig. 1.



Witnesses.

W. B. Corwin
Jno. K. Smith

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Thomas Griffiths
by his attys
Baker Hall & Kerr

N. PETERS. Photo-Lithographer. Washington. D. C.

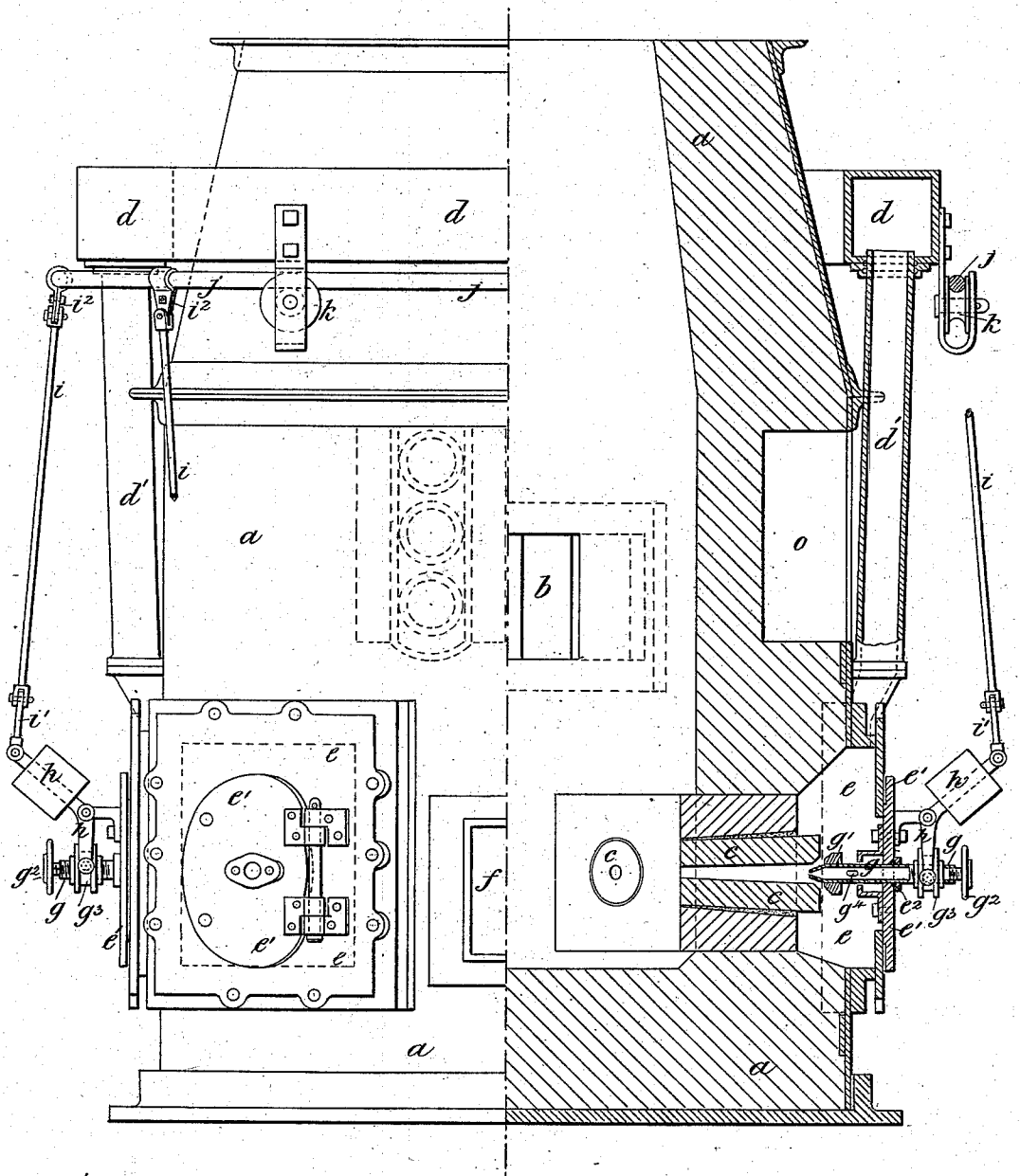
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T. GRIFFITHS.

CONVERTER.

No. 295,545. Patented Mar. 25, 1884.

Fig. 2.



Witnesses.

W. B. Corwin

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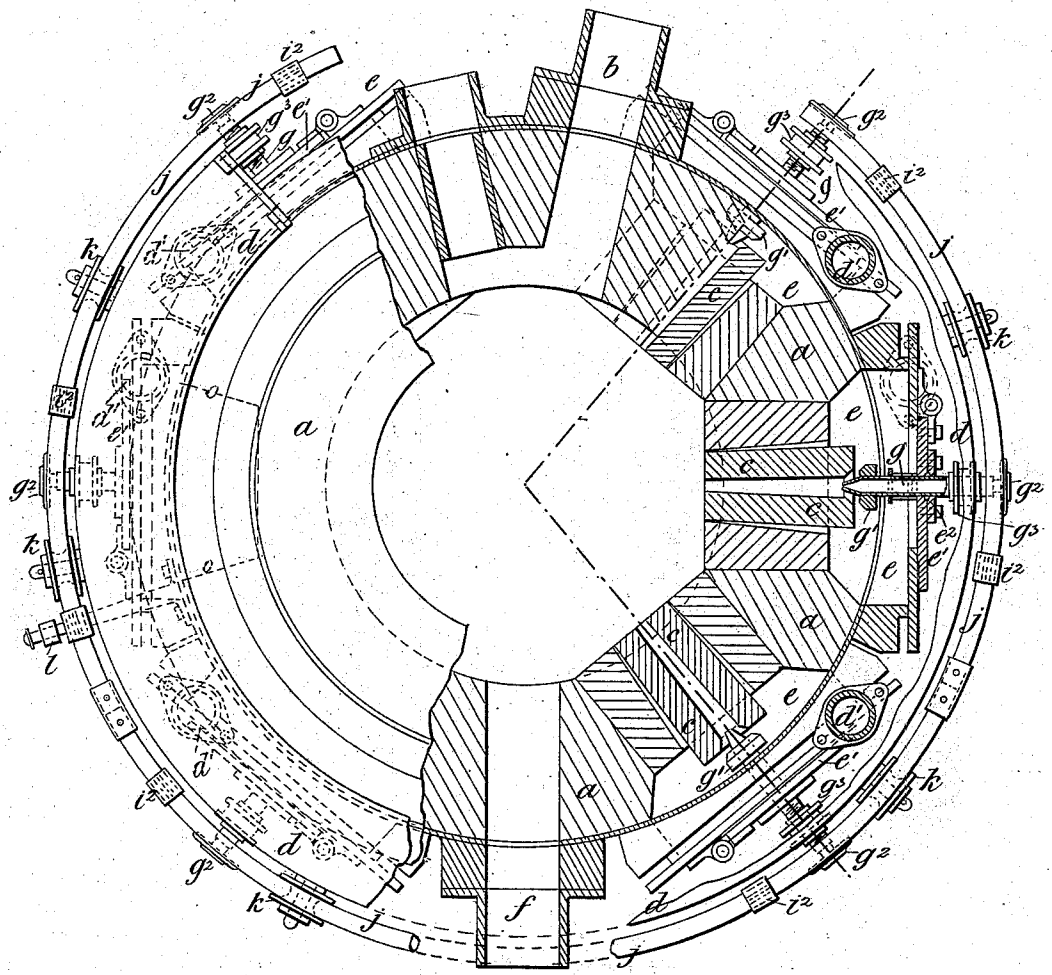
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T. GRIFFITHS.

CONVERTER.

No. 295,545. Patented Mar. 25, 1884.

Fig. 3.



Witnesses.

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(No Model.) 4 Sheets—Sheet 4.

T. GRIFFITHS.

CONVERTER.

No. 295,545. Patented Mar. 25, 1884.

Fig. 5.

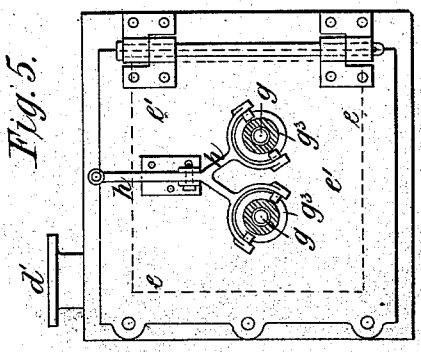


Fig. 6.

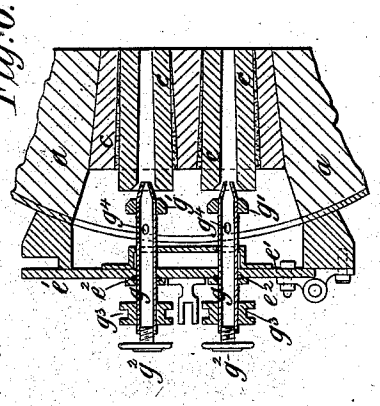
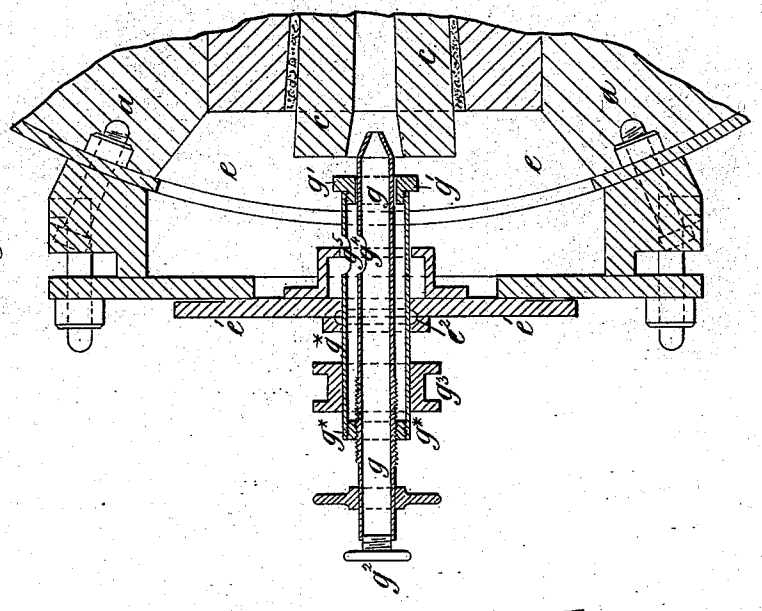


Fig. 4.



Witnesses.

W. B. Corwin
Jno K. Smith

Inventor.

Thomas Griffiths
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N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

THOMAS GRIFFITHS, OF ABERGAVENNY, COUNTY OF MONMOUTH, ENGLAND.

CONVERTER.

SPECIFICATION forming part of Letters Patent No. 295,545, dated March 25, 1884.

Application filed November 3, 1883. (No model.) Patented in England May 19, 1883, No. 2,504.

To all whom it may concern:

Be it known that I, THOMAS GRIFFITHS, a subject of the Queen of Great Britain, residing at Abergavenny, in the county of Monmouth, England, have invented certain new and useful Improvements in Converters, (for which I have received Letters Patent in Great Britain, No. 2,504, dated May 19, 1883,) of which the following is a specification.

The invention has for its object improvements in means or apparatus employed in the manufacture of iron and steel.

In the specification of Letters Patent granted to William John Clapp and myself, dated February 6, 1883, No. 271,683, is described a method of closing and opening the passage through the tuyeres by means of plugs or stoppers formed to fit seats at the rear ends of the tuyeres, such plugs or stoppers being provided with pistons fitting cylinders, which pistons are acted upon in one direction to force the plugs or stoppers against their seats to close the passage through the tuyeres, and in the other direction to remove the plugs or stoppers from their seats, and thereby open the passage through the tuyeres; and in order to prevent the metal cooling within the tuyere when the plug or stopper is forced to its seat, a small aperture is formed in the plug or stopper and in its tubular rod to enable a small blast of air to enter the tuyere.

In the specification of an application filed by me on October 15, 1883, Serial No. 109,184, I described methods of closing the passage through the tuyeres by sliding valves or covers mounted on axes of motion, so as to move in a circular path, or in guides, so as to move in a right line.

Instead of using the means and apparatus above referred to for effecting the closing and opening of the passage through the tuyere, I, according to my present invention, form or fix a stuffing-box in the cover of each blast box or chamber, and pass therethrough a tube, to which the plug or stopper is fixed, and in such case the outer end of the tube has removably fitted therein a stopper, which, when removed, enables a view of the tuyere to be obtained, and I give motion to the tube, and consequently to the plug or stopper, by a weighted lever acting upon the same by suitable connections, and operated by a rod or chain connected to a rod or chain passing around the converter and supported on suitable guides. I also employ a small tube passed through a comparatively large tube carrying and operating the stopper. The smaller tube has formed on the outside thereof a screw which screws into a nut formed or fixed in the end of the larger tube, by which means I am enabled by rotating the smaller tube to adjust the nozzle thereof to any required position within the tuyere. Instead of passing the small blast of air through a small aperture in the center of the plug or stopper, such aperture can be formed around the edge of the plug or stopper, or in the seat for the same. I also provide large openings in the converter above the tuyeres to facilitate repairs, and I close these openings by suitable blocks or doors.

In order that my said invention may be more clearly understood and readily carried into effect, I will proceed, aided by the accompanying drawings, more fully to describe the same.

In the drawings, Figure 1 is an elevation, Fig. 2 is partly an elevation and partly a vertical section, and Fig. 3 is a plan, partly in section, of a converter with my present improvements applied thereto. Fig. 4 is a horizontal section of parts of the above converter drawn to a larger scale, and showing a slight modification. Fig. 5 is a front elevation, and Fig. 6 is a vertical section, of a modification.

In the various figures like parts are marked with similar letters of reference.

a is the body of the converter. *b* is the charging-aperture. *c* are the tuyeres. *d* is the main blast-pipe surrounding the upper part of the converter, and *d' d'* are branch blast-pipes conveying the blast from the main blast-pipe *d* to the blast boxes or chambers *e*, and *f* is the discharge-aperture. The parts above described form no part of my present invention.

I will first describe my invention as represented at Figs. 1, 2, 3, and 4.

In carrying my present invention into effect I form or fix a stuffing-box, e^2, in the cover *e'* of each blast box or chamber *e*, and pass therethrough a tube, *g*, to which the plug or stopper *g'* is fixed, and in such case the outer end of the tube *g* has removably fitted therein a stopper, g^2, which, when removed, enables a view of the tuyere to be obtained, and I give motion to the tube *g*, and consequently to the plug or stopper *g'*, by a weighted clutch-lever, *h*, the lower end of which is forked, so as to

act in combination with a grooved collar, g^3, screwed or otherwise adjustably fixed on the tube g, and such weighted clutch-lever h is, as shown by the full lines, operated by a rod, i, which is connected thereto by a link, i', and by a link, i^2, to a circular rod, j, passing around the upper part of the converter, where it is supported on suitable guide-rollers, k. A lever, l, is connected to the rod j, to enable the same to be readily moved in either direction, as may be required. The parts i, i', and i^2 may, however, be dispensed with, and, as shown by the dotted lines in Fig. 1, a chain, i^3, may be used in lieu thereof, in which case one end of the chain i^3 would be connected directly with the clutch-lever h, and after passing over a guide-wheel, k', it is connected at its other end with the circular rod j. By the means above described the plug or stopper g' can be caused to open the passage through the tuyere by simply moving the lever l in the direction of the arrow, a suitable stop or catch (not shown) being provided to retain said lever l in such position when required, while by relieving the lever l from such stop or catch the weighted clutch-levers h will be free to act, and will thereby cause the plugs or stoppers g' simultaneously to close all the passages through the tuyeres c. By disconnecting the rod i or chain i^3 from the clutch-lever h, any of the tuyeres c can be closed independently of the others.

To facilitate adjustment I sometimes pass the tube g through a larger tube, g^*, which latter carries and operates the plug or stopper g'. In this case the tube g has formed on the outside thereof a screw-thread, which screws into a nut formed or fixed in the outer end of the tube g^*, by which means I am enabled, by rotating the tube g, to adjust the nozzle thereof to any required position within the mouth of the tuyere, and thereby to regulate the area of the opening in the end of the tuyere, and consequently the amount of blast passing through the tuyere. This regulation is necessary when it is found that the blast passing through any tuyere is in excess or short of that required. Holes g^4 g^5 are formed in the tubes g g^*, to enable the blast to pass into the interior of the tube g, so that when the plugs or stoppers g' are forced against the ends of the tuyeres a small stream of blast is permitted to pass into the tuyeres through the tubes g, in order to keep the metal out of the tuyeres.

At Figs. 5 and 6 I have represented parts of a converter with two tuyeres c side by side in a single blast-box e. In this case both the plugs or stoppers g' are simultaneously operated by a single weighted clutch-lever h, formed with two forks at its lower end, as shown at Fig. 5.

Instead of passing the small blast of air through a small aperture in the center of the plug or stopper g', a passage or passages can be formed around the edge of the plug or stopper g', or in the seat for the same at the end of the tuyere, as will be well understood.

I also provide large openings o in the converter above the tuyeres c, to facilitate repairs of the interior of the converter from the exterior thereof, and thereby avoid the necessity for entering the converter when repairing the same, and I close these openings o by suitable blocks or doors; but I do not claim this as part of my present invention.

It is admitted that sight-holes through the casing have been devised for use in a cupola in connection with tuyeres having means for closing them; but the construction is different from mine, as it has no tubular stem for operating a stopper having an opening through it. It is also admitted that hollow spindles of hydrocarbon burners and furnaces, open from end to end, to admit air, have been devised, and that such spindles have been placed in other tubes in which they were adjustable to regulate the relative flow of oil and air; but such adjustment was not designed to affect the movement of a tuyere-valve, and was not applicable for such purpose, and hence such devices do not anticipate applicant's construction.

Having thus described the nature of my said invention and the mode in which I carry the same into effect, I would have it understood that what I claim is—

1. In a converter having blast-chambers and tuyeres, the combination of stem or tube g, plug or stopper g', grooved collar g^3, and weighted clutch-lever h, connected to the rod j, by which all the plugs or stoppers g' are simultaneously operated, substantially as herein shown and described, and for the purpose stated.

2. In a converter having blast-chambers and tuyeres, the combination of the axially-moving tube g^* and stem or tube g with a plug or stopper, g', and means for adjusting the stem or tube g with relation to the tube g^* and to the tuyere, substantially as and for the purposes described.

3. In a converter having external air-chambers, the combination of the tuyere with its plug or stopper and one or more small grooves in their meeting faces, to admit a small stream of air to the tuyere when the valve is closed, substantially as and for the purposes described.

4. In a converter having external blast-chambers, the combination of the tuyeres and their plugs or stoppers with sliding stems for operating said plugs or stoppers from the outside of the chamber, weighted crank-levers for operating the stems in one direction, and mechanism for operating them simultaneously in the other, substantially as and for the purposes described.

Witnesses: THOS. GRIFFITHS.

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Notary Public, Newport, Monmouth.

S. WILLIAMS,
Consular Clerk, Newport, Monmouth.