

T. ASH & Z. WALKER.

COMBINED METALLURGIC FURNACE AND STEAM BOILER.

No. 179,148.

Patented June 27, 1876.

Fig. 1.

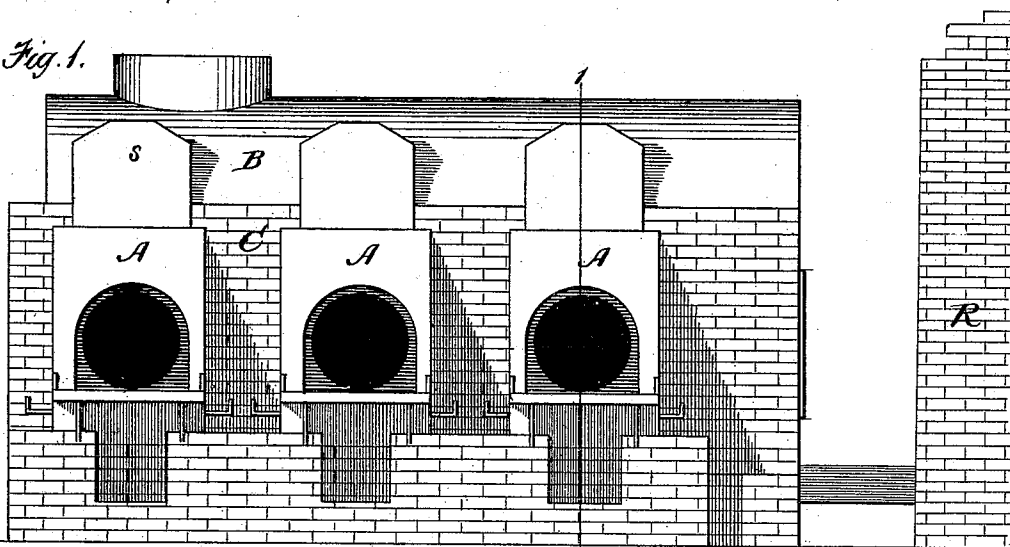
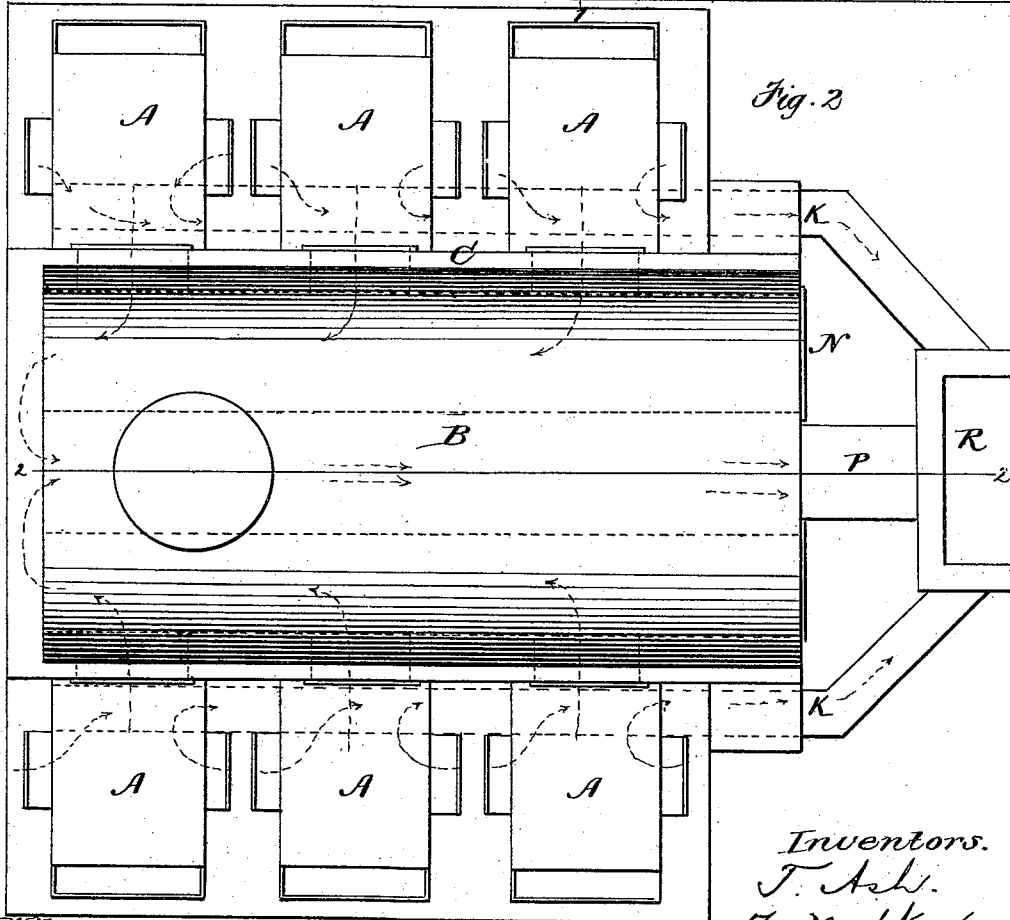


Fig. 2



Witnesses.
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Fig. 3.

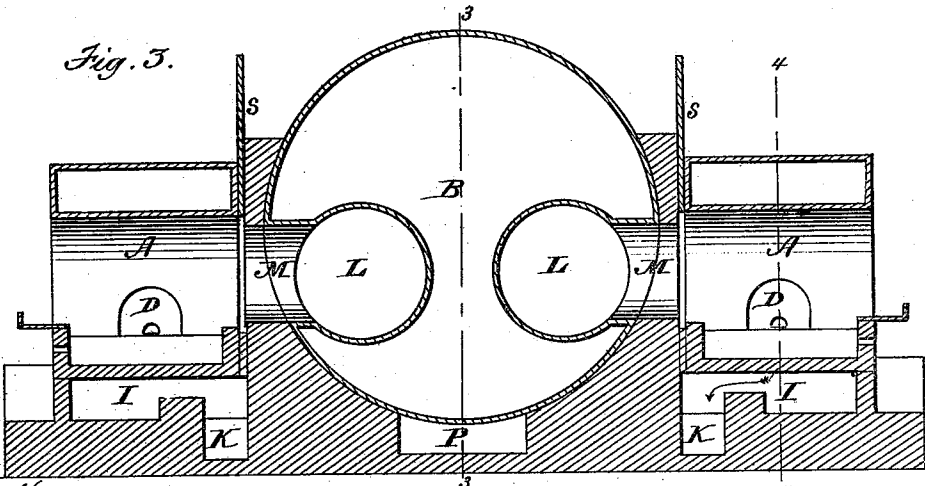


Fig. 4.

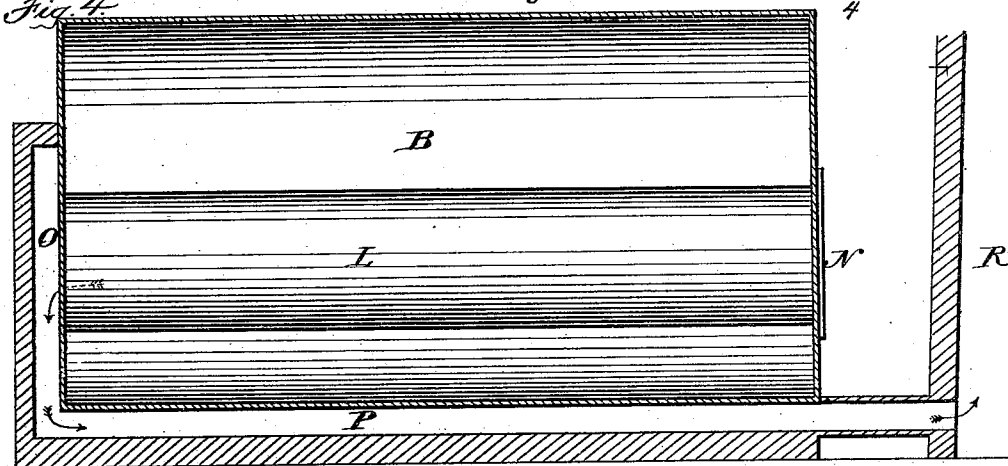
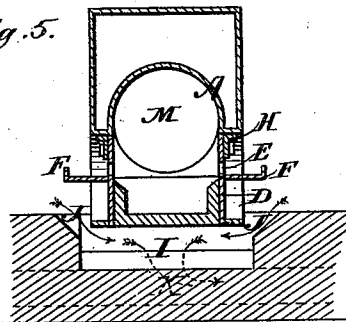


Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS ASH AND ZECHARIAH WALKER, OF TRENTON, NEW JERSEY.

IMPROVEMENT IN COMBINED METALLURGIC FURNACES AND STEAM-BOILERS.

Specification forming part of Letters Patent No. **179,148**, dated June 27, 1876; application filed February 17, 1876.

To all whom it may concern:

Be it known that we, THOMAS ASH and ZECHARIAH WALKER, of Trenton, in the county of Mercer and State of New Jersey, have invented certain Improvements in Finery-Furnaces for the Manufacture of Iron, of which the following is a specification:

In the accompanying drawings, forming part of this specification, Figure 1 represents a side elevation of an apparatus embodying our invention. Fig. 2 represents a plan view of the same. Fig. 3 represents a section on the plane of line 1 1, Fig. 1. Fig. 4 represents a section on the plane of line 2 2, Fig. 2. Fig. 5 represents a section on the plane of line 4 4, Fig. 3.

This invention is an improvement on that for which Letters Patent were granted to us November 25, 1873, said patented invention consisting in certain improvements in the construction of finery-furnaces, and in the combination of one or more finery-furnaces with a boiler in such manner that steam was generated by the waste heat from the furnaces.

Our present invention consists in certain additional improvements in the construction of finery-furnaces and the boiler which is heated thereby, said improvements having for their object to improve the result of the combination of the furnaces with the boiler, all of which we will now proceed to describe.

In the drawings, A A, &c., represent the finery-furnaces, which are constructed with double walls, having water-spaces, as in our former patent. B represents the boiler, which is set in a suitable casing, C. In the sides of the furnaces A are arched openings, in which are placed the removable tuyere-plates D D, each having a tuyere-opening, E, and a tuyere-rest, F. The tuyere-plates D are secured to the sides of the openings in the furnace-walls by angle-irons H, which are detachably connected to the furnace and the plates, thus enabling the latter to be removed when burnt out.

Beneath the bottom of each of the furnaces A is an air-chamber, I, which is provided with openings J J for the admission of external cool air, and is connected with a horizon-

tal flue, K, which is in turn connected with the stack or chimney of the furnaces, or with any suitable device which will cause currents of outside air to enter the chambers I and pass through them into the flue K, these currents reducing the temperature and prolonging the durability of the bottoms of the furnaces.

These currents of air which become heated by contact with the bottoms of the furnaces may be used to supply the tuyeres, thereby giving hot-blasts to the furnaces.

In our former patent the boiler was provided with one interior tube or flue, into which branch tubes or flues from the furnaces opened. By this construction, when two series of furnaces are employed, one on each side of the boiler, direct openings are created across the boiler, and when the wind blows strongly the products of combustion are liable to be blown out of the mouths of the furnaces on the lee side of the boiler instead of being drawn into the boiler, thus depriving the boiler of much of the heat it would otherwise receive, and producing intense heat at the mouths of the furnaces, to the great inconvenience and discomfort of the workmen.

We now obviate this difficulty by providing the boiler with two flues or tubes, L L, between which there is no direct communication, each communicating only with the series of furnaces adjacent to it, as shown in Fig. 3, this communication being effected by flues M, which are made partly in the boiler and partly in the casing C.

The flues L L are provided, if desirable, with fire-grates and doors, N N, at one end of the boiler, and at the opposite end open into a space, O, between the end of the boiler and the casing C. The space O communicates with a flue, P, which extends under the boiler to the stack or chimney R, as shown in Fig. 4.

It will be seen that when the fires are kindled in the furnaces A, the products of combustion will pass to the chimney through the flues L L of the boiler, the space O and the flue P under the boiler, the latter being all the time subjected to the heat and receiving the fullest benefit therefrom.

The flues M are provided with cut-offs or gates, S, whereby the heat from the furnaces may be excluded from the boiler.

We claim as our invention—

The combination of the boiler B, having the independent flues L L, the flues M, the furnaces A, the space O, and the flue P, all arranged and operating substantially as and for the purposes specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS ASH.
ZECHARIAH WALKER.

Witnesses:

SAML. M. BARTON,
C. F. BROWN.