(No Model.) 2 Sheets—Sheet 1.

J. P. WITHEROW.

CONVERTER.

No. 327,421. Patented Sept. 29, 1885.

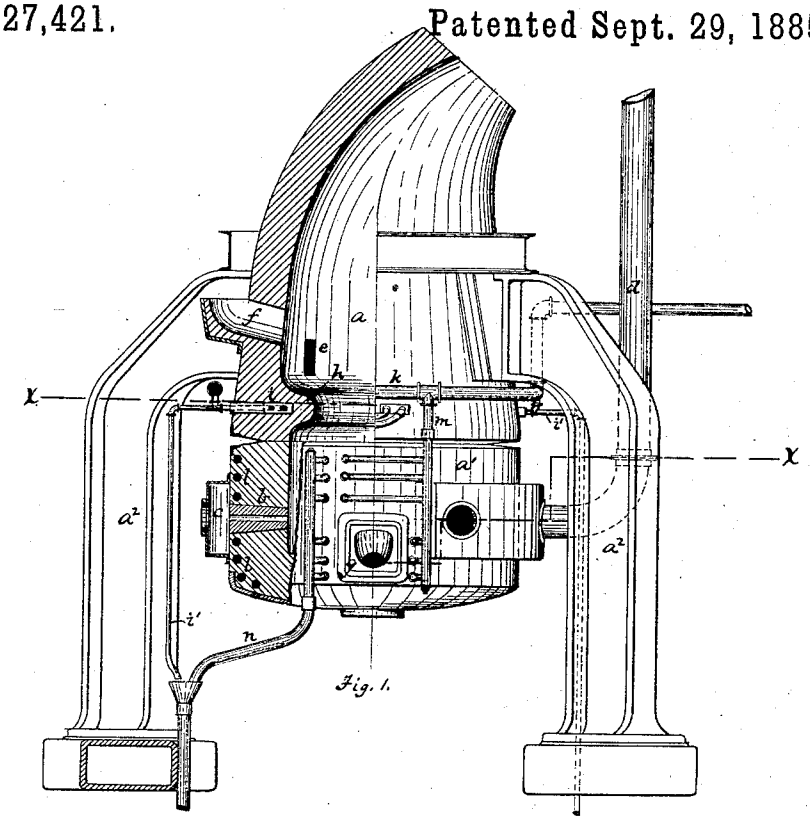


Fig. 1.

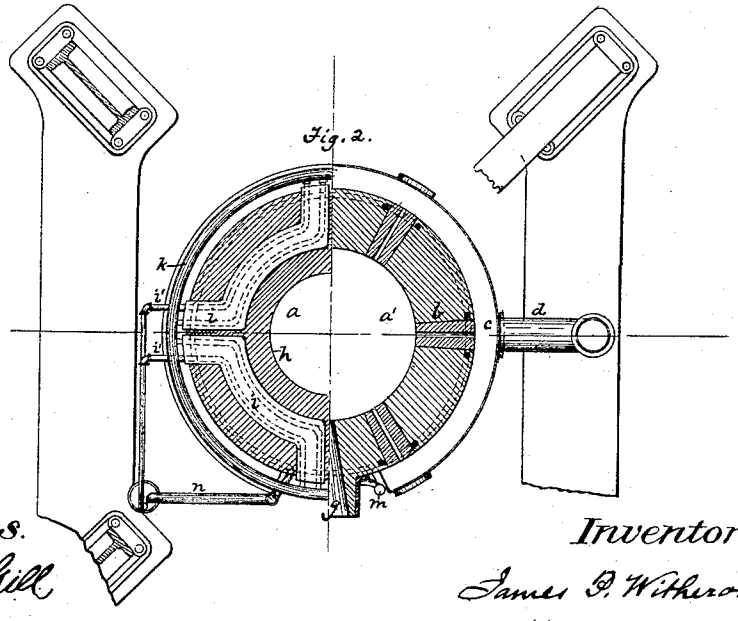


Fig. 2.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

J. P. WITHEROW.

CONVERTER.

No. 327,421. Patented Sept. 29, 1885.

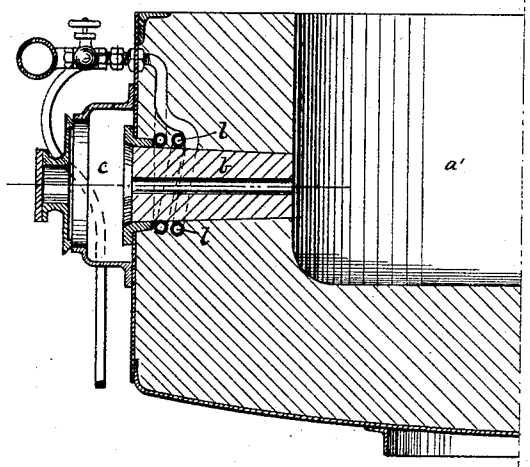


Fig. 3.

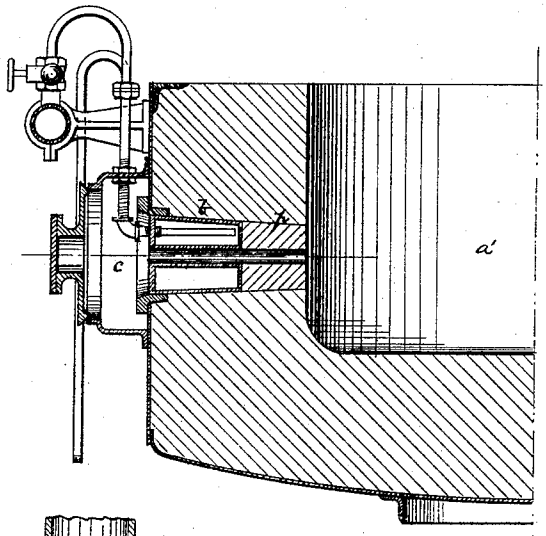


Fig. 4.

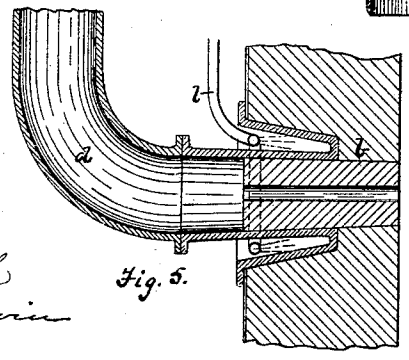


Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES P. WITHEROW, OF ALLEGHENY CITY, PENNSYLVANIA.

CONVERTER.

SPECIFICATION forming part of Letters Patent No. 327,421, dated September 29, 1885.

Application filed July 3, 1885. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. WITHEROW, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Converters; and I do hereby declare the following to be a full, clear, and exact description thereof.

My improvement is particularly designed to prevent the rapid destruction of the linings and tuyeres of converters. It also relates to other features of construction.

To enable others skilled in the art to make and use my invention, I will now describe it by reference to the accompanying two sheets of drawings, in which—

Figure 1 is an elevation, partly in section, of a fixed converter constructed in accordance with my invention. Fig. 2 is a horizontal section on the line *x x*, Fig. 1. Figs. 3, 4, and 5 are sectional views showing modifications.

Like letters of reference indicate like parts.

The converter is composed of upper and lower sections, *a a'*, each having an outer metallic shell and inner lining of ganister or other refractory material, the former being fixed and supported on posts a^2, and containing the slagging-hole *e* and charging-hole *f*, and the latter being detachable and provided with tuyeres *b*, bustle-pipe *c*, blast-pipe *d*, and tapping-hole *g*. The upper section, *a*, has an inwardly-projecting ridge or bulge, *h*, at or near its lower end, which forms a contraction or neck in the interior of the vessel, such ridge being preferably provided with an embedded cooling or water-plate or coil, *i*, to protect it from the wasting action of the molten metal in the vessel. This plate or coil may be continuous, or may be formed in segments, as shown in Fig. 2, and it is supplied with water from the pipe *k* and provided with outlet-pipes *i'*. The slagging-hole *e* is placed above the ridge *h*. The linings of the bottom or lower section, *a'*, and the tuyeres *b* are the parts most liable to wear, and particularly the lining around the inner ends of the tuyeres. To protect the lower section, I place in the lining inside of the metal shell a coil or coils of water-pipe, *l*, which is supplied with water from the pipe *k* by means of a branch pipe, *m*. The water escapes by an outlet-pipe, *n*. In forming or lining the bottom the coil or coils *l* are preferably held in place in the empty shell, and the lining material is plastered around them, and then dried in the usual way.

Instead of using coils I can make the shell hollow, and provide it with the water-connections. As the inner ends of the tuyeres and the lining immediately around them wear most rapidly, special protection can be extended to them by encircling the outer end of the tuyeres with two or more turns of the water-pipe, as shown in Fig. 3, or by using a water-tuyere, as shown in Fig. 4, or a water-spray tuyere, as shown in Fig. 5. The tuyere shown in Fig. 4 is provided with a nose, *p*, made of suitable fire-brick or refractory clay, so that the molten metal shall not come in contact with the metal shell of the tuyere.

If desired, the water-coils may extend throughout the upper section, *a*. The placing of the slagging-hole above the neck portion of the converter is of advantage in that it facilitates the slagging off of the converter by concentrating the charge when it boils up, and enabling the blast-pressure to act more effectively in raising the slag and lighter parts, whereby a more perfect separation is effected. As the ridge *h* is so much exposed to the wash of the charge, it is provided with the water-plate or coil *i*. The ridge may be placed at any desired point in the converter. The spray-tuyere is the equivalent of a water-tuyere.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A converter having a metal shell and a lining of refractory material, with its sides and bottom provided with water-coils embedded in the lining, substantially as and for the purposes described.

2. A converter provided with a removable bottom or lower section, having a metal shell and a lining of refractory material with water-coils embedded in the lining, substantially as and for the purposes described.

3. A converter provided with tuyeres, having water-pipes placed in the lining and coiled around the tuyeres, substantially as and for the purposes described.

4. A converter having a water-cooled neck and charging and slagging holes above the neck, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 29th day of June, A. D. 1885.

JAMES P. WITHEROW.

Witnesses:
W. B. CORWIN,
THOMAS B. KERR.