

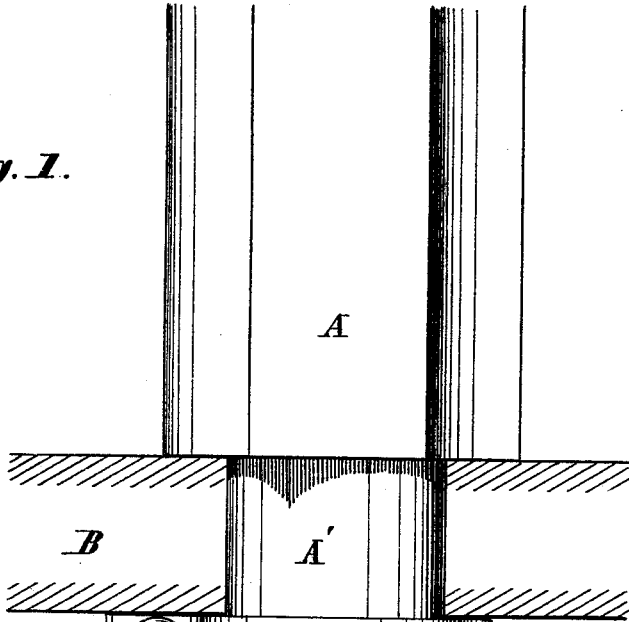
A. J. HAWS.

BESSEMER CONVERTER BOTTOMS.

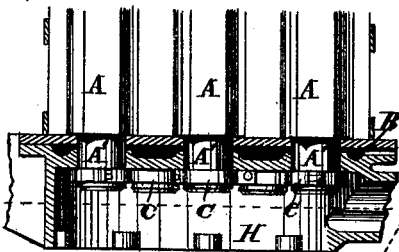
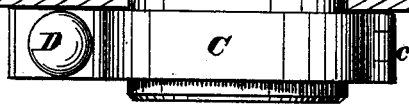
No. 188,899.

Patented March 27, 1877.

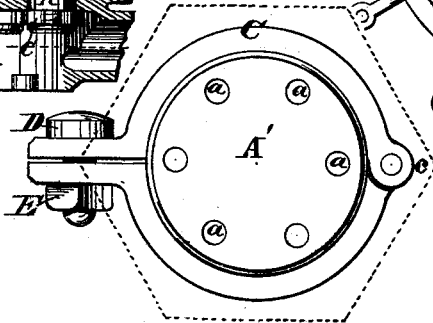
*Fig. 1.*



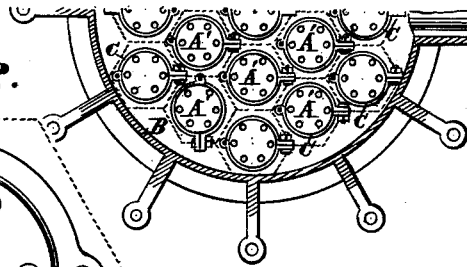
*Fig. 3.*



*Fig. 2.*



*Fig. 4.*



WITNESSES

*Chas J. Cook*  
*Le Blond Burdett.*

INVENTOR

*Andrew J. Haws.*  
*By Knight and* Attorneys

# UNITED STATES PATENT OFFICE

ANDREW J. HAWS, OF JOHNSTOWN, PENNSYLVANIA.

## IMPROVEMENT IN BESSEMER-CONVERTER BOTTOMS.

Specification forming part of Letters Patent No. 188,899, dated March 27, 1877; application filed December 29, 1876.

*To all whom it may concern:*

Be it known that I, ANDREW J. HAWS, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a certain new and useful Improvement in Bessemer-Steel-Converter Bottoms, of which the following is a specification:

My invention relates to a mode of attaching bricks which form the bottom of a Bessemer-steel converter, the said bricks being constructed with lugs projecting down into the tuyere-box, and being constructed with longitudinal tuyere or blast openings, extending down through the said lugs.

The invention consists in securing the bricks to the tuyere-box by means of clamps encircling the lugs hinged at one side and fastened by a screw at the other, so as to serve the combined purpose of fixing the bricks, and forming washers to close the joints between the lugs and the plate of the tuyere-box.

In the accompanying drawings, Figure 1 is an elevation of a tuyere-brick, with the fastening applied. Fig. 2 is an underside view of the same. Fig. 3 is a vertical section of the entire bottom on a smaller scale, showing the bricks and their fastenings in elevation, and omitting the lower part of the tuyere-box. Fig. 4 is an under side view of one-half of the bottom, (omitting the lower part of the tuyere-box,) also in a smaller scale.

A represents a brick made preferably of

hexagon form in transverse section, as shown by the dotted lines in Fig. 2, so that any necessary number of the said bricks may be fitted close together to form the bottom of a Bessemer-steel converter. *aa* are tuyere-openings in the said bricks. B represents the upper plate of the tuyere-box, which may be made in two parts, leaving an air chamber between. It will be observed that the lug A' of the brick A extends downward, so as to project within the tuyere-box H to a sufficient distance to receive clamp-rings C, which encircle the lugs A'. The said rings are hinged at *c*, and are pressed together at their extremities by bolts and nuts D E.

The clamp-rings thus engage beneath the top plate of the tuyere-box, fixing the bricks firmly in position, and at the same time the clamps serve as washers to close the joints between the lugs and the top plate of the box. Separate washers may be added, if desired, to assist in forming tight joints.

Having thus described my invention, the following is what I claim as new therein, and desire to secure by Letters Patent:

The bricks A, provided with lugs A', in combination with clamp-rings C, fitting around the said lugs, in the manner set forth.

ANDREW JACKSON HAWS.

Witnesses:

C. T. FRAZER,

A. MONTGOMERY.