

(No Model.)

2 Sheets—Sheet 1.

J. P. WITHEROW.

CONVERTER.

No. 327,420.

Patented Sept. 29, 1885.

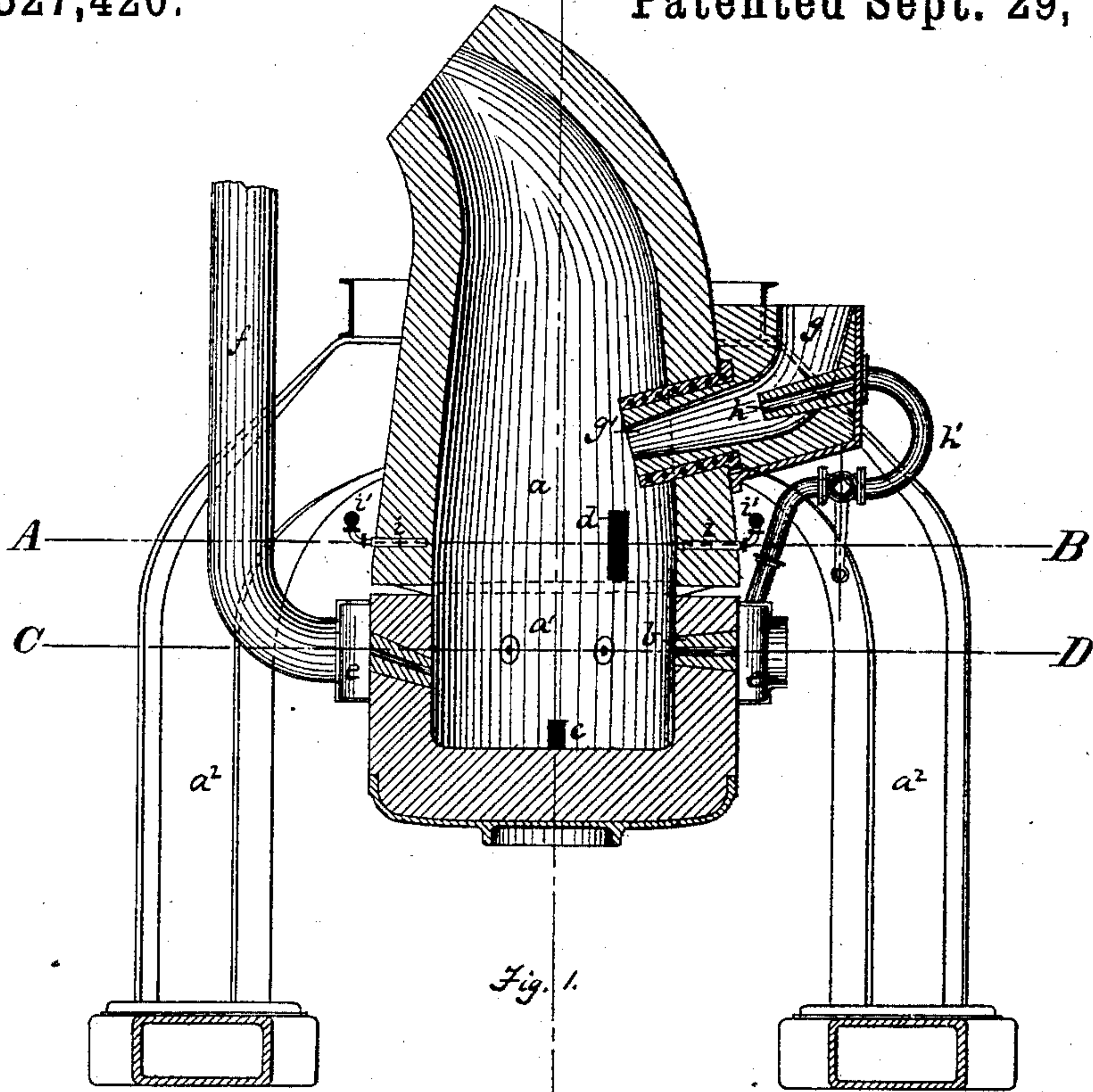


Fig. 1.

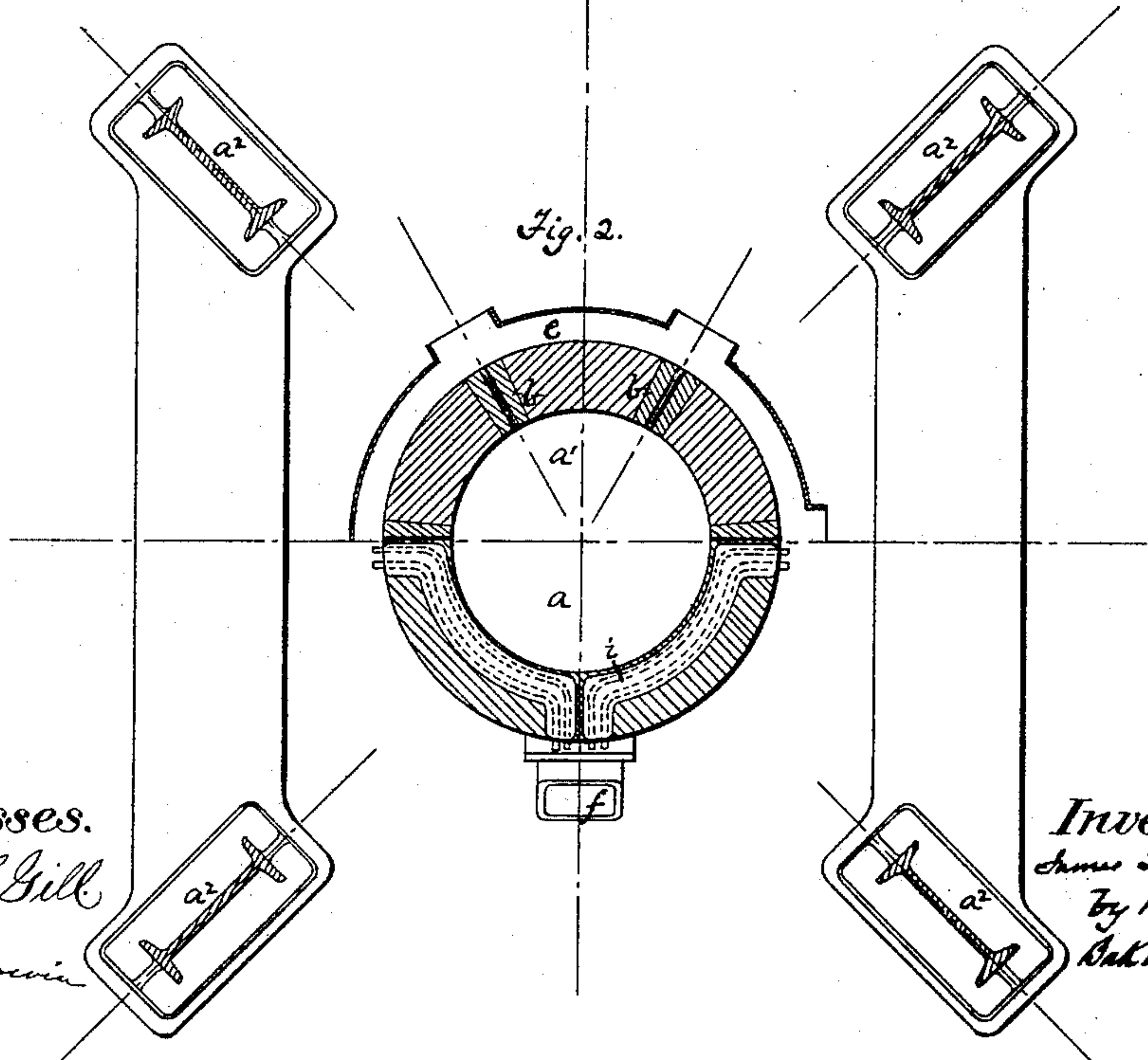


Fig. 2.

Witnesses.
Harry L. Gill
W. H. B. Green

Inventor.
James P. Witherow
By his attys
Baker & Hill

(No Model.)

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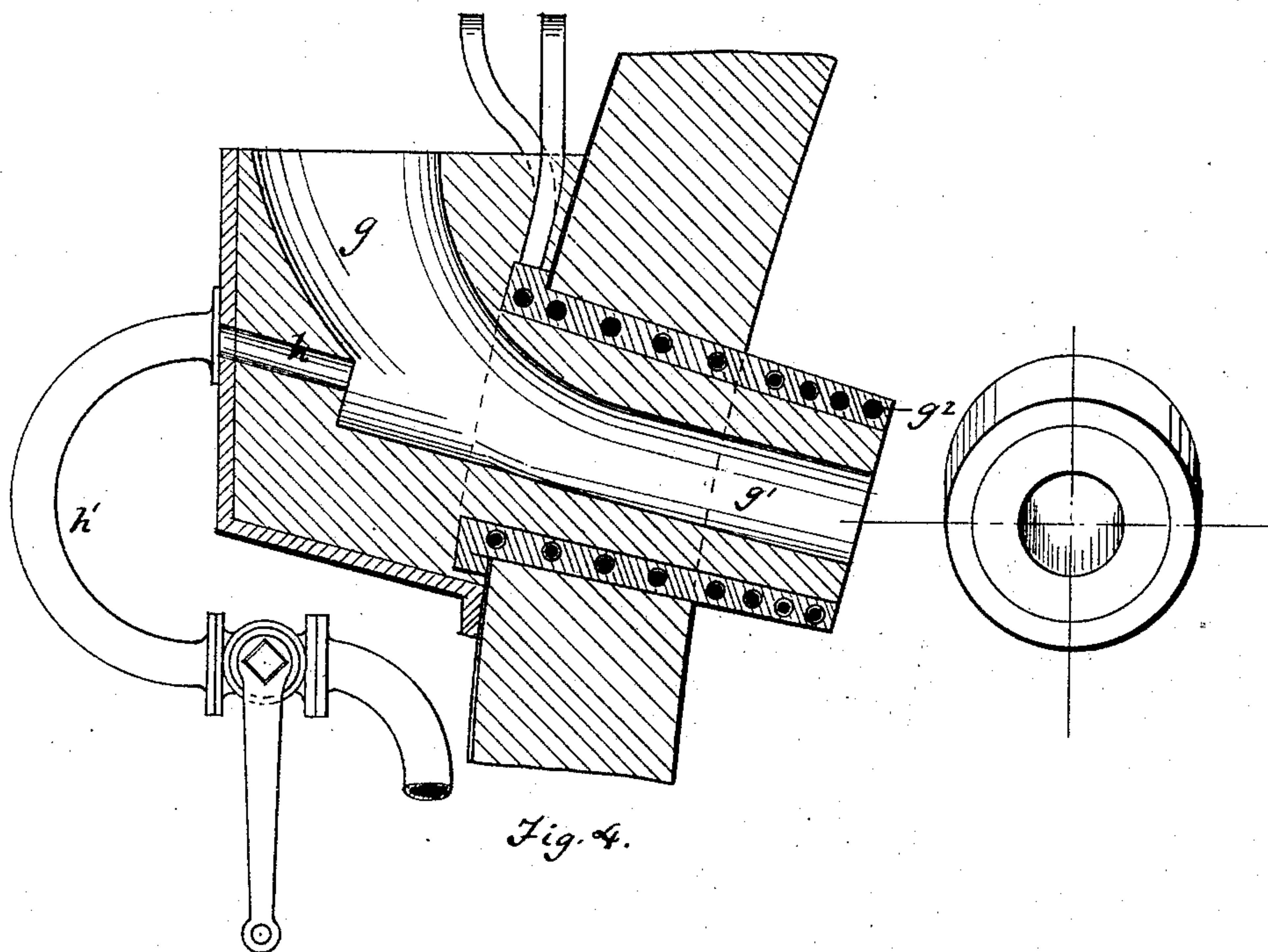


Fig. 4.

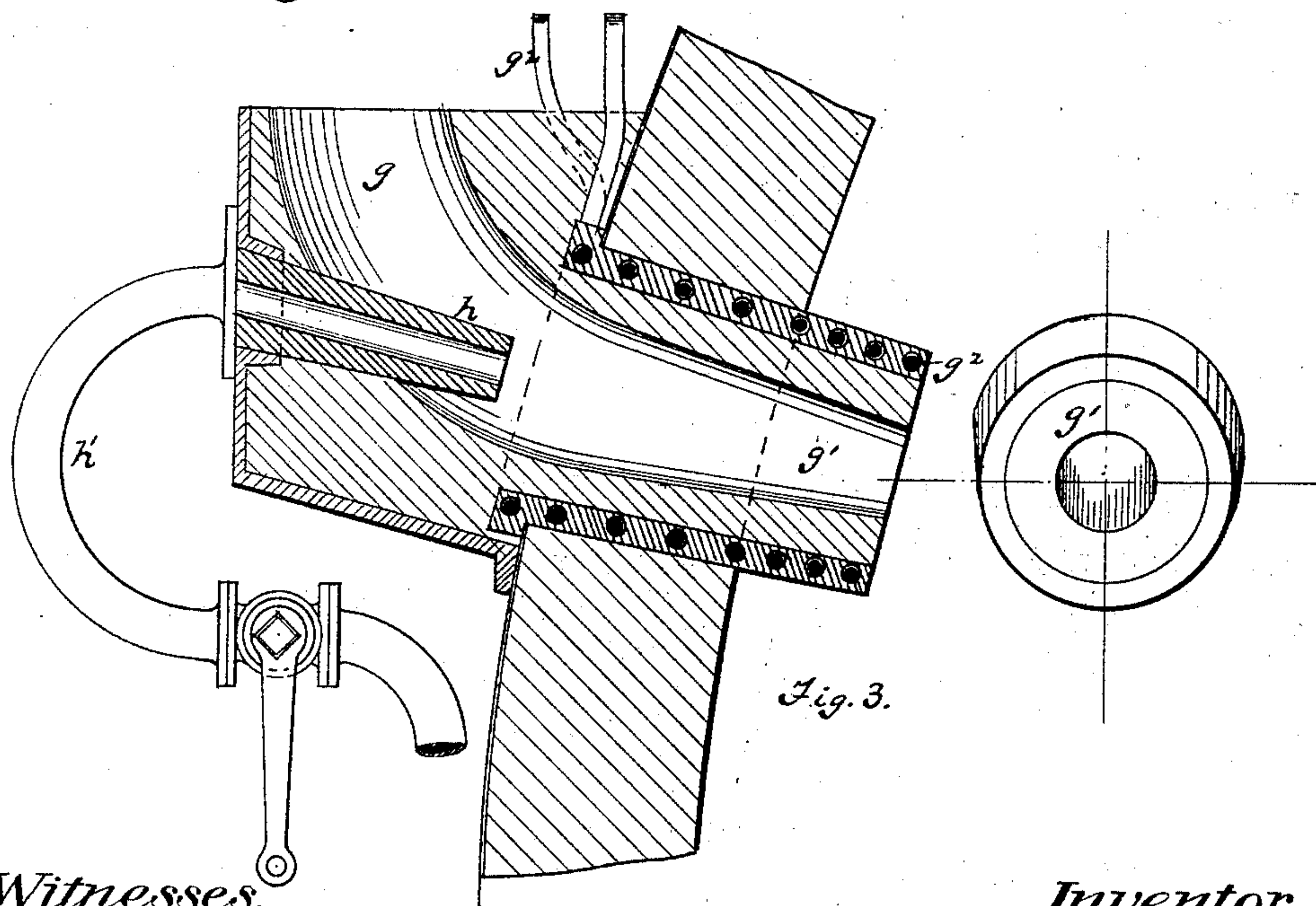


Fig. 3.

Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES P. WITHEROW, OF ALLEGHENY CITY, PENNSYLVANIA.

CONVERTER.

SPECIFICATION forming part of Letters Patent No. 327,420, 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.

This improvement in converters relates more particularly to the construction of the charging hole or spout, and is designed to the more perfect carrying into effect of the method described in an application of even date herewith of oxidizing a portion of the metal during the earlier stages of the operation in the converter for the purpose of forming a base for the creation of a silicious slag whereby the silicon of the charge is removed.

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

Figure 1 is a vertical section of a converter having my improvements. Fig. 2 is a horizontal section partly on the line A B and partly on the lines C D of Fig. 1. Fig. 3 is an enlarged view of the pouring-spout shown in Fig. 1. Fig. 4 is a modification.

Like letters of reference indicate like parts. The converter shown in Fig. 1 is composed of two parts, the upper or fixed part, *a*, being supported by standards or pillars *a*², and the lower or removable portion, *a'*, being secured in the usual manner. The converter is provided with tuyeres *b*, extending through its sides, which tuyeres in this instance are placed at or near the metal-line, the latter being indicated by section-line C D. It is also provided with a tapping-hole, *c*, slagging-hole *d*, and charging-hole *g*. The charging-hole *g*, instead of merely passing through the side of the vessel, is provided with a spout, *g'*, preferably cooled by water-coils *g*², the end of which spout projects beyond the side into the interior of the vessel, so that the stream of metal from the charging-hole *g* shall fall clear of the side of the vessel. The interior of the tube or spout *g'* is lined with fire-brick or fire-clay, for the purpose of protecting the same from the cutting action of the metal.

Embodied in the lining at or near the lower end of the fixed part *a* of the converter is a

water-cooled plate, *i*, having inlet and outlet connections with external water-pipes, *i'*. The function of this water-plate is to protect the lining of the lower end of the upper part of the converter from being worn away by the scouring and cutting action of the metal under treatment. It is particularly desirable to have this water-plate arranged on the side opposite to the charging-spout *g'*, as the vessel is somewhat exposed at that point to the splashing effect of the incoming charge.

The lower portion of the converter is provided with a bustle-pipe, *e*, which supplies air to the tuyeres *b*, which pipe is connected with the blast-engine by means of the pipe *f*. The blast is turned on before the metal is charged into the converter, so that the stream falling from the charging-spout *g'* shall be exposed on all sides to the impinging action of the air from the tuyeres, which will thereby come into more intimate contact with the particles of metal, they being in a divided state, and produce a more rapid oxidation, so that at the time the metal reaches the tuyere-level a sufficient base is formed on the top of the charge for the purposes mentioned. To increase this oxidizing effect, and to further divide and break up the falling stream of metal, I have provided the charging spout or opening with a tuyere, *h*, which is connected with the bustle-pipe by means of a suitable pipe, *h'*, and which blows into or through the charging-spout. The tuyere *h* need not project into the charging-opening, but may terminate at the rear side of the same, as shown in Fig. 4.

By the use of the apparatus described I effect a very rapid oxidation of the charge during the time it is entering the converter, which oxidation is prolonged by placing the tuyeres at or near the metal-line, as illustrated in Fig. 1.

I do not limit myself to forming the charging-spout with water-coils, as the same may be made of refractory clay or fire-brick without any such coils; nor do I limit myself to the use of a projecting charging-spout, as the same effect may be accomplished by means of a projection of the lining below the charging-opening and beyond the line of the inner side of the vessel, the idea being to secure the clear fall of the metal in the interior of the vessel and beyond the side of the same. Such con-

struction would therefore be the equivalent of the projecting spout.

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

5 1. A converter having an inwardly-projecting charging-spout, substantially as and for the purposes described.

2. A converter having a charging-spout provided with water-coils, substantially as and
10 for the purposes described.

3. A converter having a charging spout or opening, in combination with a tuyere for blowing a jet of air into or through the same, substantially as and for the purposes de-
15 scribed.

4. A converter having a charging spout or

opening, with a tuyere projecting into said spout or opening, substantially as and for the purposes described.

5. A converter having a removable lower sec- 20
tion containing the tuyeres, and upper section provided with a charging-hole, and water-coils arranged in the lining at the lower end of the upper section, substantially as and
25 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.