No. 757,059. PATENTED APR. 12, 1904.

P. SCHMIEDER.

FURNACE FOR PRODUCING ZINC.

APPLICATION FILED OCT. 29, 1902.

NO MODEL.

Fig. 1.

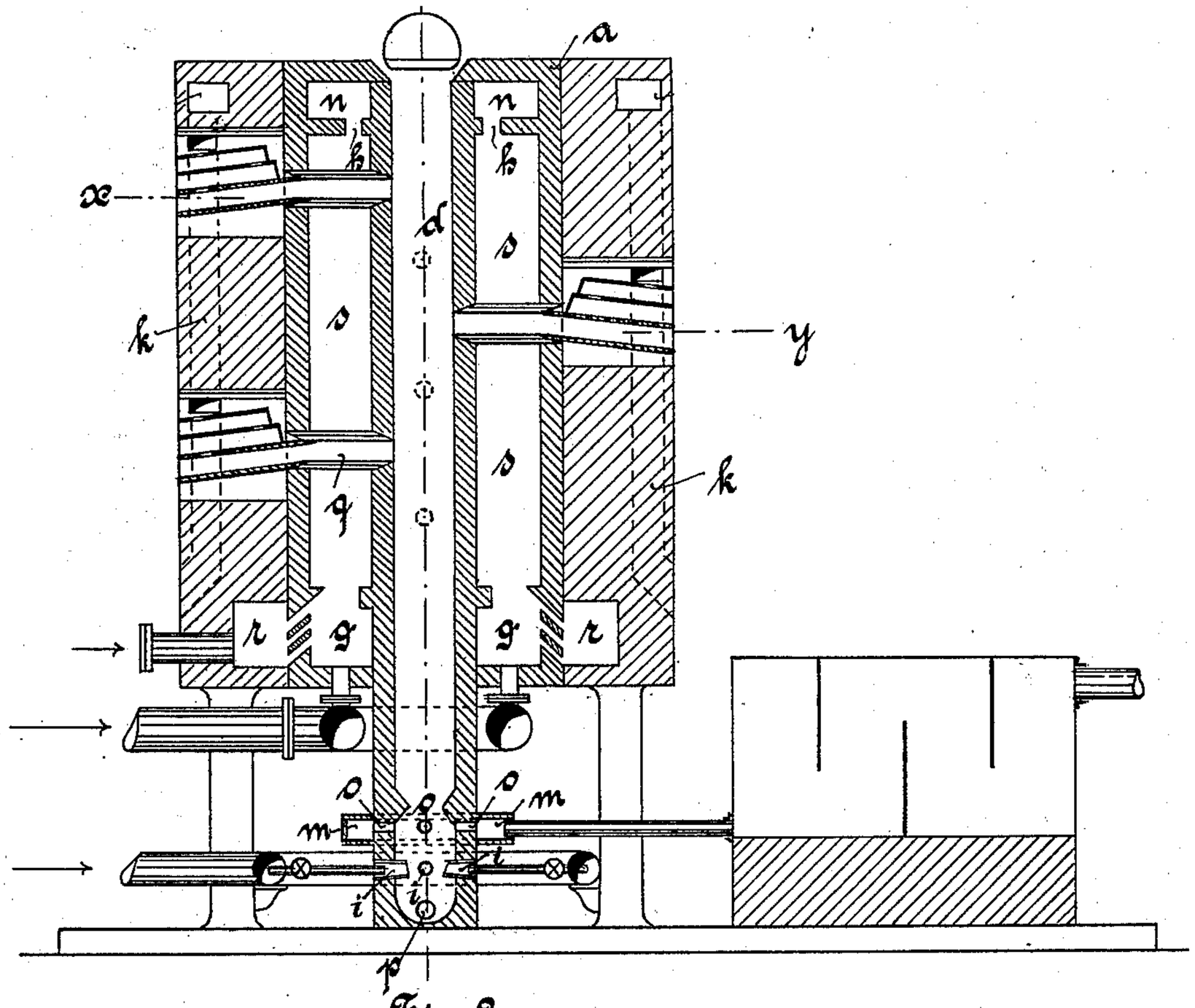
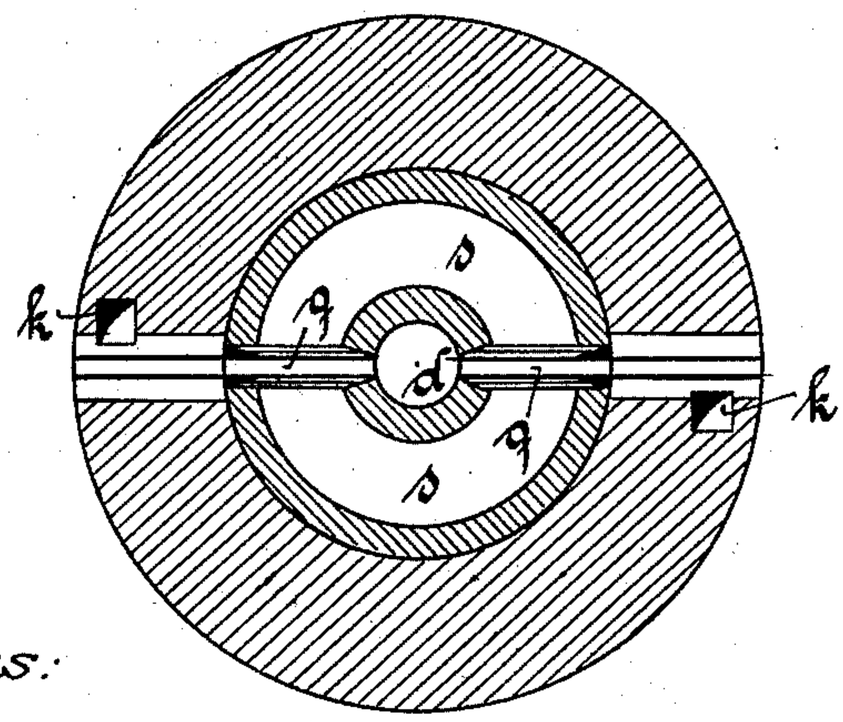



Fig. 2.




Witnesses:

Thos. D. Lindsay

Waldo M. Chapin

Inventor

Paul Schmieder

by Wm. A. Rosenbaum

Atty.

No. 757,059. Patented April 12, 1904.

# UNITED STATES PATENT OFFICE.

PAUL SCHMIEDER, OF LIPINE, GERMANY.

## FURNACE FOR PRODUCING ZINC.

SPECIFICATION forming part of Letters Patent No. 757,059, dated April 12, 1904.

Application filed October 29, 1902. Serial No. 129,267. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL SCHMIEDER, engineer, of Lipine, Upper Silesia, Germany, have invented new and useful Improvements in Furnaces for Producing Zinc, of which the following is a specification.

My improved furnace consists of a vertical shaft which contains the zinc ores, together with the fuel. The upper part of this shaft is surrounded by an annular space into which waste gases are introduced and burned. At suitable distances above each other suitable condensers, such as are commonly used in muffle-furnaces for the same purpose, are provided in this part of the shaft. The lower part of the shaft is in contact with the air and is provided with twyers through which compressed and preferably heated air is introduced for the purpose of oxidizing the zinc still contained in the slag. The oxids of zinc are led away through suitable openings above the twyers and are condensed in a suitable chamber. In the upper part of the shaft the greater part of the zinc contained in the ores is extracted in the usual manner by reduction, while the zinc remaining in the slag is recovered in the lower part of the shaft by oxidation. Between the reducing and oxidizing zone of the shaft there is a neutral zone, which offers some resistance to the ascent of the gases produced by the introduction of the air and diverts them into the proper channel.

The furnace is illustrated by the drawings, which show, in—

Figure 1, a vertical section, and in Fig. 2 a horizontal section, through the furnace on the line *x y* of Fig. 1.

*d* is the shaft, which is surrounded in its upper part by flues for the fire-gases, while the under part is not heated.

The upper part of the furnace is provided with condensers *q*. The non-condensing gases, for the greater part carbon monoxid, escape from the condensers through the openings indicated above them into the flues *k*, which communicate with the chimney. The heating-gases enter into the flues *s* by the channel *g*, the air for the consumption of the gas by the channel *r*. The fire-gases passing through the flues *s* heat the upper part of the furnace and escape by the openings *h* and the channel *n* into the chimney.

The under part of the furnace, which is not heated on the outside, is at a good distance from the heater part provided with twyers *i* for the compressed air. Below the twyers *i* there is a slag-hole *p*, and above at a short distance from the twyers there are openings *o*.

The air is introduced into the lower part of the shaft for the purpose of recovering the zinc remaining in the slag. In this manner oxids of zinc are produced and are led through the openings *o* and channel *m* to a collecting-chamber, where they are recovered.

The middle part of the furnace, between the holes *o* and the heater part, forms a neutral zone which separates the upper zone, where metallic zinc is produced, from the lower zone, where zinc oxid is produced.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a furnace for extracting zinc, the combination of a vertical receptacle or shaft for the charge of ore mixed with fuel, with a device for heating the upper part of the charge through the walls of said receptacle, a number of condensers or collectors of the liquid zinc for this reduction-chamber, a number of twyers in the lower part of the shaft which is not arranged to be heated, an oxidation-chamber, a condensing-chamber and openings above the twyers and suitable channels for leading the gases from this oxidation-chamber for the slag to the condensing-chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PAUL SCHMIEDER.

Witnesses:

ERNST KATZ,

ALBERT SCHENK.