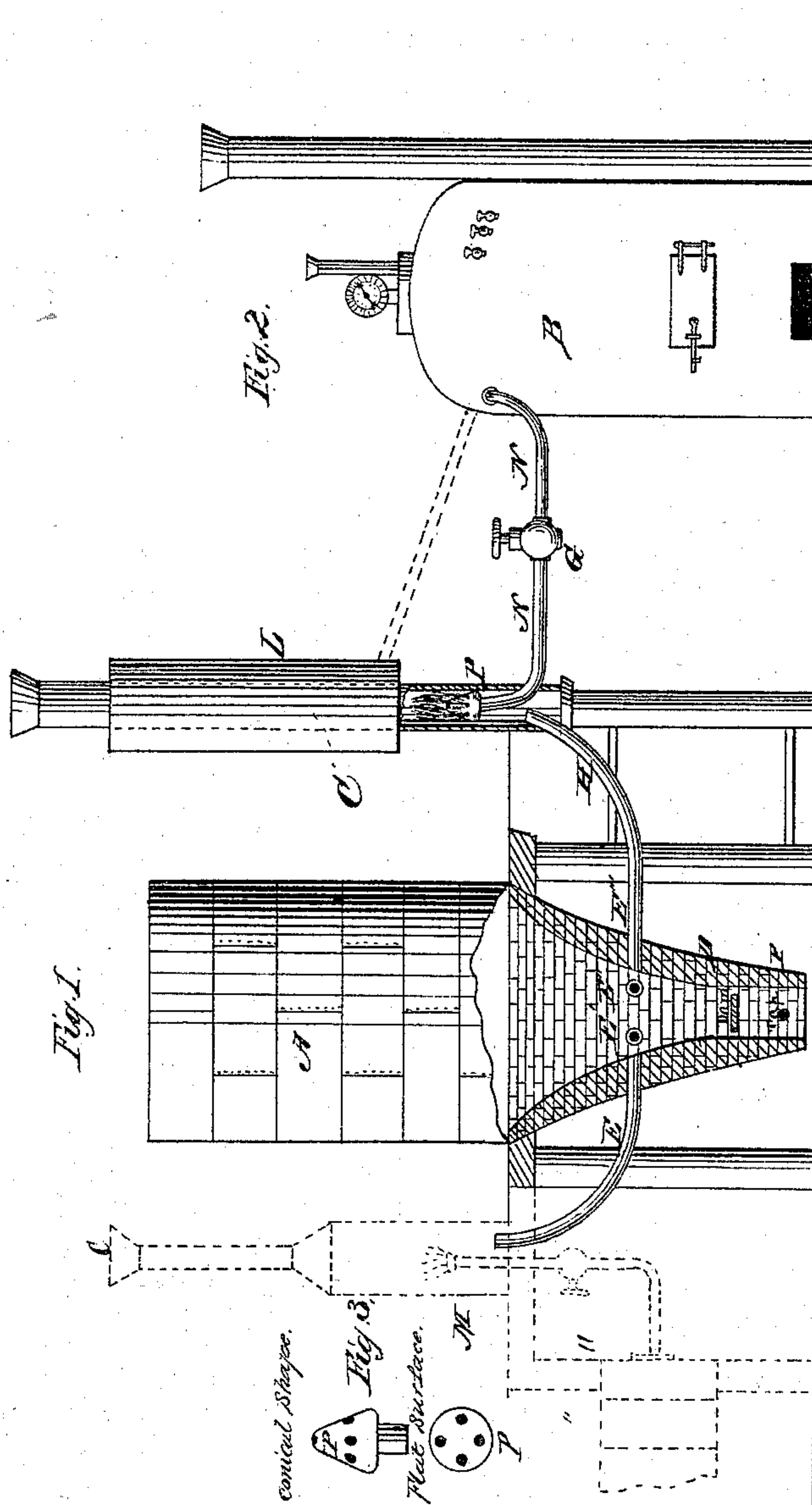


D. W. HENDRICKSON.
Blast Furnaces.

No. 137,366.

Patented April 1, 1873.



Witnesses.

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Inventor

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UNITED STATES PATENT OFFICE.

DAVID W. HENDRICKSON, OF RED BANK, NEW JERSEY.

IMPROVEMENT IN BLAST-FURNACES.

Specification forming part of Letters Patent No. **137,366**, dated April 1, 1873; application filed October 7, 1872.

To all whom it may concern:

Be it known that I, DAVID W. HENDRICKSON, of the city of Red Bank, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in the Mode of Constructing and Operating Blast and Cupola Furnaces; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, which is lettered to correspond with and form a part of this specification.

In order that the public may fully understand the nature of my invention, and those skilled in the construction and operation of furnaces may know how to build and use the same, I will describe it as follows, to wit:

Figure 1, letter A represents a blast-furnace or cupola with an open top, being, as it were, reversed, with the draft or suction applied at the bottom instead of at the top, as in the old way, the draft and blast coming downward in the furnace and out at the bottom or lower portion of the furnace, instead of going upward and out at the top.

Fig. 2, letter B represents a boiler for generating steam, built in any desirable form or shape, placed in a convenient position so that steam-pipes may be connected with flues or chimneys, marked letter C in the accompanying drawing, which forms a part of this specification. Letters E E' E'' E''' are pipes or tuyeres for conducting the hot air and gases from furnace to chimney C. The draft is created by a jet of steam let into chimney C by pipe N from boiler B, operated by a steam-cock, G, one or more, as the occasion may re-

quire. Steam-pipe N is fitted and covered with a conical or flat covering, pierced with four or more one-quarter-inch holes, as in letter P, to distribute the steam-jets, making, as it were, four jets from one pipe, or more, if desirable.

Fig. 3, letter P represents a nozzle or covering to pipe N, pierced with holes for emitting steam. The top of the furnace is left open, forming, as it were, one vent or tuyere.

The nozzle or covering P for steam-pipe N, pierced with one or more holes of any desired shape, flat or conical, has superior advantages over a single jet of steam, as in the old way; it prevents what is known as eddies or back currents in the flue, chimney, or pipes into which it is discharged, causing a more powerful draft, and giving more satisfactory results with the same pressure of steam, arranged and operated as shown in the accompanying drawing, which forms a part of this specification.

I claim as my invention—

1. The combination, as shown in the accompanying drawing, furnace A, boiler B, steam-pipes N, nozzle P, flues C, and tuyeres E E' E'' E''', substantially as and for the purposes hereinbefore set forth.

2. The nozzle or covering P for pipe or pipes N, or plurality of jets of steam, substantially as and for the purposes hereinbefore set forth.

D. W. HENDRICKSON.

Witnesses:

WM. J. ALLENBACK,
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