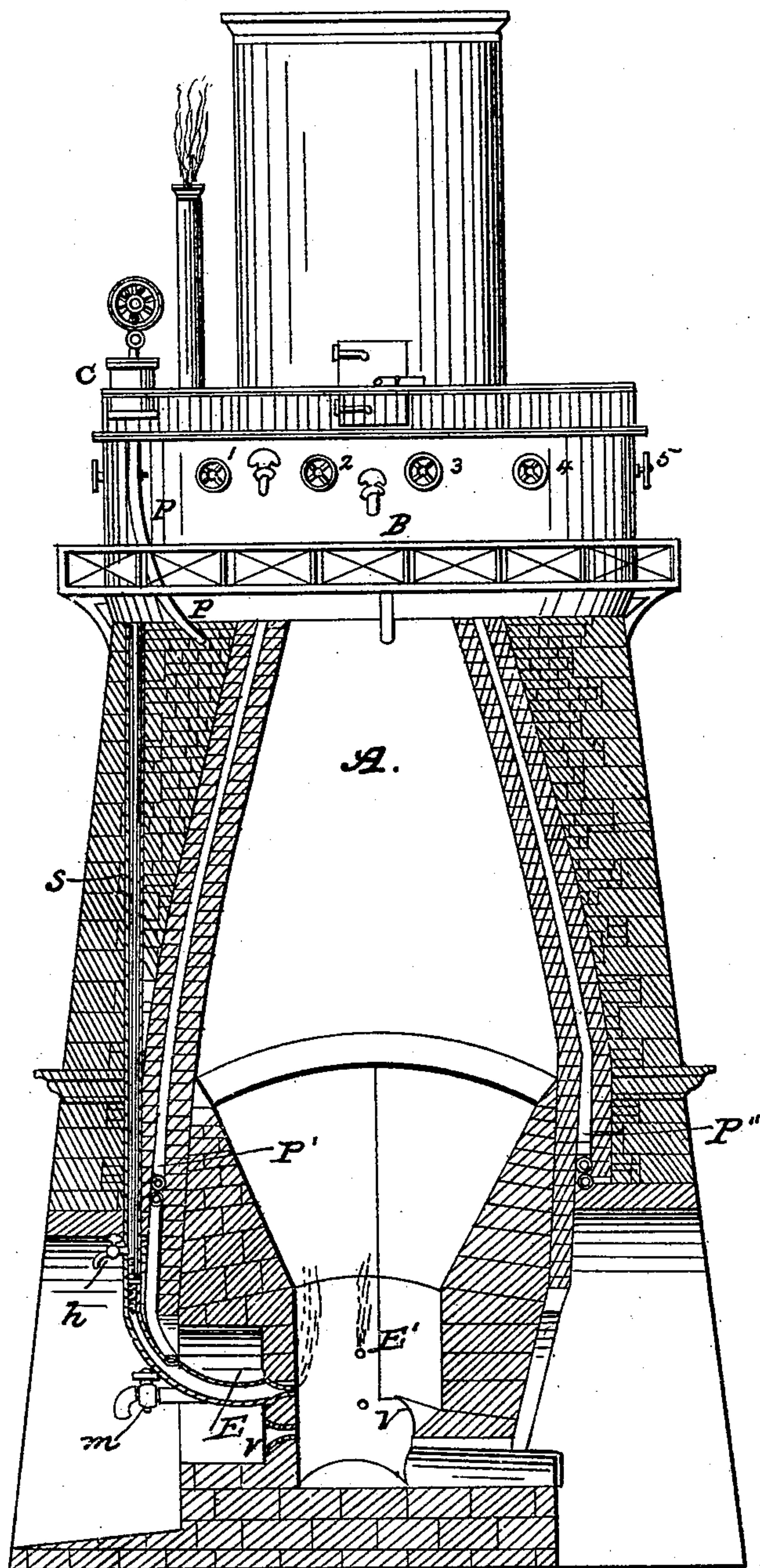


HENDRICKSON & McLEAN.  
Blast Furnace for Making Iron.

No. 68,565.

Patented Sept. 3, 1867.



WITNESSES  
*J. D. Bellings*  
*William Walchorn*

INVENTORS  
*D. W. Hendrickson*  
*James P. McLean*

# United States Patent Office.

DAVID W. HENDRICKSON AND JAMES P. McLEAN, OF NEW YORK, N. Y.,  
ASSIGNORS TO DAVID W. HENDRICKSON, OF THE SAME PLACE.

*Letters Patent No. 68,565, dated September 3, 1867.*

## IMPROVED BLAST-FURNACE FOR MAKING IRON.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that we, DAVID W. HENDRICKSON and JAMES P. McLEAN, of the city, county, and State of New York, have invented certain new and useful Improvements in Blast-Furnaces for Making Iron; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which are lettered to correspond with and form a part of the specification.

To enable others skilled in the art of manufacture of iron-furnaces to construct and operate the same, we will describe it as follows, to wit:

Figure 1 is a vertical section of our furnace, having our improvements therein.

Letter A is the ore-chamber; B is a jacket-boiler, surrounding the tunnel-head, cupola, or stack; C is an air-pump, operated at the top of the furnace by means of a stationary engine placed upon the platform over the boiler, or any other suitable place. E E' are hot-blast flues, which receive the superheated steam from the steam pipe or pipes S, in combination with the heated air which is forced through the hot-air pipe or pipes P P' P'' by the pump C, or by any other available means that would keep up a uniform blast of hot air and superheated steam through the same tuyeres E E', thereby forming a compound blast of any desired pressure by the application of the air-pump, or an equivalent thereof; thus the lighter gases contained in the steam and air are disseminated through the decomposing ore in the chamber A to assist combustion and desulphurizing the ore.

We do not confine ourselves to a jacket-boiler at the top of the furnace to create and keep up a compound blast of hot air and superheated steam; neither do we confine ourselves to the specific arrangement of blast pipes through or around the interior walls of the furnace, as detached boilers may be employed such as are in common use, and the pipes S and P P' P'' may be differently arranged to apply to old furnaces that are in operation at the present time.

We believe that the superiority of the above arrangement over the ordinary blast produced by a blower (for making iron) is, first, the great saving of power by the use of an air-pump, which may be successfully worked by a small engine, whereas it would require one twice as large to operate an ordinary fan-blower; secondly, by the commingling of the two hot blasts in the same tuyeres, we are enabled to produce a more powerful and a more uniform blast; also to eliminate a greater amount of hydrogen gas to assist the process of smelting.

Therefore, what we claim as new and useful, and what we wish to secure by Letters Patent of the United States, is—

1. The use of the air-pump C, to produce and keep up a uniform blast.
2. We claim commingling the superheated steam and hot air in the same tuyere or tuyeres E E', which are suitably arranged through the walls of the furnace A, and operated by means of an air-pump, or its equivalent power, substantially as above set forth.

In testimony whereof we hereunto subscribe our names in the presence of two witnesses.

DAVID W. HENDRICKSON.  
JAMES P. McLEAN.

Witnesses:

J. H. MORROW,  
Mrs. J. H. MORROW.